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LONDON
SCHOOL *of*
HYGIENE
& TROPICAL
MEDICINE



‘Sexual Competence’ at first intercourse: a critical assessment of a public
health concept

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LONDON SCHOOL OF HYGIENE & TROPICAL MEDICINE

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Statement of Own Work

I, Melissa Palmer, confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signed:

A handwritten signature in black ink, appearing to read 'Melissa Palmer', written in a cursive style.

Abstract

Background: The timing of first sexual intercourse has long been of public health concern and a predominant focus of research into the sexual behaviour of young people. The onset of sexual activity has most commonly been defined in terms of chronological age – with particular attention to ‘early’ sex. Arguments for a more nuanced concept of timing have been made on the grounds that age fails capture individual differences and the context of the encounter. The concept of ‘sexual competence’ was most notably first operationalised by Wellings et al. (2001) using self-reports of four variables. Participants were classified as ‘sexually competent’ at first heterosexual intercourse if they reported the following four conditions: contraceptive protection, autonomy of decision (not due to external influences such as alcohol or peer pressure), consensuality (equal willingness of both partners), and acceptable timing (that it occurred at the ‘right time’).

Methods: Using data from the Third National Survey of Sexual Attitudes and Lifestyles (Natsal-3), this study used a range of methods (confirmatory factor analysis, latent class analysis, and multivariable logistic regression) to conduct a quantitative examination of the properties of, and factors associated with, the measure of sexual competence at first intercourse. Supplementary analyses using two other datasets (Avon Longitudinal Study of Parents and Children, and Dunedin Multidisciplinary Health and Development Study) were also carried out in order to examine specific research questions that emerged. Finally, in-depth interviews were conducted with a subsample of Natsal-3 respondents to explore how they formulated their answers to the survey questions used to construct the measure of sexual competence.

Findings: Statistical analyses found evidence that the four components of the sexual competence measure tap into a single underlying construct, and that the measure is associated with a range factors in the directions expected. For example, sexual non-competence at first intercourse was associated with several adverse sexual health outcomes, including sexually transmitted infections, unplanned pregnancy, and low sexual function. The qualitative component of this research found that responses to the four survey questions were formulated with reference to characteristics of the self, the partner, and the relationship, as well as what happened *after* the event of first intercourse.

Conclusions: For a rather simply constructed operationalisation of a complex concept, the measure of sexual competence at first intercourse performs well empirically. The findings presented support the concept’s further integration into public health research and practice, and add to the evidence base supporting emphasis on enabling young people to protect the physical, social, and emotional aspects of their sexual health, from the onset of sexual activity.

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1. Chapter 1: Introduction

The timing of first sexual intercourse has long been of public health concern. In the 1970s and 1980s, and to this day in some countries, the focus was on occurrence before marriage (Hitchens and James, 1965; Reiss, 1965). Subsequently, attention shifted to age at occurrence and in particular ‘early’ age, often described in terms of sex before the legal age of consent or before the age of majority. However, the use of chronological age as the sole criterion of the appropriateness of the timing of first sexual intercourse neglects individual differences in physical and emotional maturity, and also the considerable cultural variation in social norms and legislation governing the timing of sexual initiation (Fenton et al., 2005).

The term ‘sexual competence’ has recently been introduced into the public health lexicon in relation to conceptual and empirical aspects of onset of sexual activity. The measurement of ‘sexual competence’ at sexual debut aims to increase the sophistication with which the concept of ‘timing’ is treated empirically. This approach takes the view that sexual activity among young people is not inherently negative or risky, and that a judgement of the appropriateness of sexual activity based solely on chronological age neglects the importance of contextual factors in defining the quality and safety of a sexual encounter. This PhD responds to the recent calls in the academic literature for a reframing of research on adolescent sexual activity, arguing that rather than exclusively focusing on adolescent sexual activity as a problem behaviour, the approach should also place emphasis on sexual development, acknowledging the “multiple facets of sexuality and sexual health, and their implications for general well-being over the life-course” (Halpern, 2010) (p. 6).

The concept of sexual competence was most notably first operationalised by Wellings et al (2001), in the second National Survey of Sexual Attitudes and Lifestyles (Natsal-2). Based on self-reports, a respondent was classified as sexually competent at heterosexual sexual debut if they reported the following conditions of first sex: consensuality (both partners ‘equally willing’), autonomy (not influenced by peer pressure or alcohol/drugs), acceptable timing (that it happened at the ‘right time’), and the use of a reliable method of contraception (condom and/or pill). The use of these four domains in defining sexual competence reflects the broader definition of sexual health endorsed by the World Health Organisation (WHO, 2006), which stresses the importance, not only of more negative biomedical aspects of sexual health, but also mental and social wellbeing, referring to a “positive and respectful approach to....sexual relationships” and “safe sexual experiences, free of coercion”.

1.1 The aim of the PhD

The measure of sexual competence at first intercourse has been included in several analyses of Natsal-2 and Natsal-3 data (Mercer et al., 2005; Wellings et al., 2001; Wellings et al., 2013; Mitchell et al., 2013), and broadly equivalent measures have also been used in other surveys in Britain (Heron et al., 2013; Testa et al., 2006). Furthermore, the measure of sexual competence is included as a key indicator in the WHO list of recommended indicators for monitoring progress towards the Millennium Development Goal of universal access to sexual and reproductive health (WHO and UNFPA, 2010). However, to date, no empirical examination of the measure has been conducted.

This PhD aims to provide a comprehensive assessment of the measure of 'sexual competence' to determine the extent to which the concept is useful for public health research and practice. The hope is that the research will promote discussion of adolescent sexual behaviour within a broad framework that takes contextual factors into account, inform future use of the measure sexual competence and inform interventions aiming to improve the physical and emotional aspects of sexual health among young people.

1.2 Objectives

1) To explore the underlying structure of the measure of sexual competence using methods from the latent variable framework, specifically:

- To assess whether the sexual competence measure demonstrates construct validity using confirmatory factor analysis of Natsal-3 data.
- To explore whether, and how many, meaningful categories of sexual competence can be derived using latent class analysis of Natsal-3 data.
- To assess whether 'enjoyment' might be an additional aspect of the measure of sexual competence using confirmatory factor analysis of data from the Avon Longitudinal Study of Parents and Children (ALSPAC).

2) To identify the antecedent factors associated with sexual (non-)competence at first intercourse.

- To investigate whether the measure of sexual competence is associated with hypothetically related factors, such as age at sexual debut, so assessing evidence for the external-criterion validity of the measure (using Natsal-3 data).

- To explore which antecedent factors are associated with sexual competence, how these differ between men and women, and their public health relevance (using Natsal-3 data).
- To examine the role of relationship length *after* first intercourse, and planning for first intercourse, in the association identified between relationship status at first sex and sexual competence at first sex (using data from the Dunedin Multidisciplinary Health and Development Study, New Zealand).

3) To explore whether sexual (non-)competence at sexual debut is associated with subsequent sexual health outcomes.

- To assess whether sexual (non-)competence at first sex is associated with self-reported STI diagnosis, HPV status at interview, low sexual functioning, unplanned pregnancy, and non-volitional sex (Natsal-3 data).

4) To explore how Natsal-3 respondents formulate their answers to the four questions which make up the sexual competence measure, using in-depth cognitive-style interviews with a subsample of Natsal-3 respondents.

2. Chapter 2: Background

This chapter explores the predominant framing of sexual activity among young people, particularly adolescents, as inherently negative and risky; examines the current preoccupation with timing of first sex defined by chronological age; and introduces the ‘competence-based’ approach to sexual and contraceptive behaviour. Given that public health research is often concerned specifically with ‘early’ first sex, defined as that which occurs before the age of consent (16 in Britain), an overview of the history and justification of the British age of consent is provided. The chapter then goes on to provide a summary of what is known about the factors associated with age at first sex, and the context of first sex – primarily focusing on British-based studies. Finally, the academic literature concerned with ‘sexual competence’ is reviewed.

2.1 The focus of research concerned with sexual activity among young people

Sexual activity in adolescence is often seen in moral terms and conceptualised as problematic by British, and other, societies. Mirroring this is the way in which adolescent sexual activity is portrayed in academic research literature; it is often considered as another ‘problem-behaviour’ (Donovan and Jessor, 1985) presented alongside smoking, alcohol and drug-use as a cluster of behaviours regarded as causes for concern. This viewpoint assumes that sex, per se, is intrinsically and inevitably risky, however, it has been argued that the ‘problem’ in this context is socially constructed due to the age and assumed immaturity of young people (Halpern, 2010). Kotchick et al (2001) comment on this phenomenon:

“most existing literature on adolescent sexuality has framed all sexual behaviour among youth as being problematic; little empirical attention has been given to the developmental processes involved in becoming a healthy sexual adult” (p.496).

Framing adolescent sexuality in this negative problem-orientated way ignores the potential positive aspects of the desire to experience and experiment in a safe manner, which have been suggested as essential precursors to healthy development (Keys et al., 2006). As a result of sexual activity in adolescence being constituted as a problem in itself, a principal focus of many studies of adolescent sexual behaviour is the simple outcome of whether the participants are ‘sexually active’ versus ‘sexually inactive’. However, in the last decade research in the field of adolescent sexuality has emerged which regards sexuality as a normative aspect of adolescent development (Tolman and McClelland, 2011).

2.2 Arbiters of the onset of sexual activity

A great deal of public health research is concerned with the *time* at which people become sexually active - usually defined by the engagement in penetrative sexual intercourse. The way in which timing of sexual intercourse is discussed - particularly the manner in which the 'right' and 'wrong' time is distinguished - has shifted over time.

The acceptability of becoming sexually active was once dependent on marital status, with pre-marital sex heavily stigmatised (Hitchens and James, 1965; Reiss, 1965). Although age was a consideration in that indicators of physical development and puberty often dictated the point at which sexual activity was appropriate, age alone was not sufficient for the acceptable transition into becoming a sexually active being. From a public health perspective, restricting sexual relations to within married monogamous couples has the potential to limit the spread of STIs and ensures that offspring are born into the care of two persons. However, the ideal of monogamy often does not hold and the status of marriage can work to limit discussion and negotiation of behaviours which protect sexual health (Mahraj and Cleland, 2005, Chimbiri, 2007).

During the latter half of the 20th Century, there were major changes in British social mores relating to sexual expression. The period following Post World War II saw increasing numbers of women entering the workforce and formal education, successive acts of legislation decriminalising homosexuality and abortion and facilitating divorce, the rise of consumerism and greater freedom for young people. The rate of cohabitation and non-marital childbearing rose greatly since the 1970s. Age at first marriage was on the increase and the advent of the contraceptive pill allowed women to control their fertility. The combined effect of these shifts meant that the transition into sexual activity was no longer intertwined with marriage (Wellings and Bradshaw, 1994). As the time gap between reaching physical maturity and first marriage increased, young people had more opportunities to engage in sexual activity out-of-wedlock. Given that the status of marriage was seen as less of a prerequisite to sexual conduct, chronological age became the main attribute by which to judge the appropriateness of the onset of sexual activity.

2.3 Age

Age is a primary social and cultural category, though its meaning varies considerably across cultures. An anthropological study exploring the meaning of age in a variety of settings found that chronological age has the greatest salience in modern, industrialised societies. The concept of age was lacking in less industrialised communities and questions about age made little sense

to participants among the !Kung Bushmen and a community in rural Clifden, Ireland (Keith et al., 1994). This diversity is also reflected by the cross-national variation in the extent to which rules relating to age are included within law, social policies, and the organisation of state-connected social institutions, for example, in most Western societies, schools and healthcare provision are organised by age to some degree (Settersten Jr and Mayer, 1997).

Chronological age is often used in research, though Settersten Jr and Mayer (1997) argue that age itself is an 'empty' variable given that one rarely assumes that age per se 'causes' a behaviour. It is whatever age is proxy for that is thought to be important, for example, physical development and emotional maturity. Neugarten and Hagestad (1976) (cited in Settersten Jr and Mayer, 1997) argue that "chronological age is often a poor indicator of biological, social, or psychological age" (p. 240) as there are significant individual differences in development. Furthermore, they posit that chronological age is "meaningless unless there is knowledge of the particular culture and the social meaning[s] attached to given chronological ages". These social meanings may stem from the age norms and constraints prevalent in most societies. Three distinct types of age norms can be identified; 1) statistical age norms, which refer to the statistical regularity in the timing of life events at the population level; 2) optimal age norms – collective beliefs about the 'ideal' or 'preferred' ages to experience particular life transitions; and 3) prescriptive and proscriptive age norms, which are the collective expectations concerned with when life transitions 'should' or 'should not' occur (Settersten Jr and Mayer, 1997).

The majority of existing research concerned with the 'optimal' timing of events, as defined by collective norms, has focused on life course transitions other than first sex, such as marriage, childbearing, and job acquisition. The evidence indicates that the average ranges of acceptability for key adult transitions, such as motherhood and marriage, have become much wider, though certain 'deadlines' still exist - most likely due to the continued existence of biological constraints (Peterson, 1996; Settersten Jr and Mayer, 1997; Neugarten et al., 1965). The strain that exists between social expectations and physiological aging is relevant for age at first sex. The median age of sexual maturation as indicated by menarche is around 13 among young women in Britain (Whincup et al., 2001), though the legal age of consent ranges from 12 to 21 globally (AVERT, 2011).

There has been little research into the perceived age norms surrounding sexual initiation, though the 2006/2007 European Social Survey (ESS) included the question: "At what age is someone too young to have sexual intercourse?" Using ESS data from 17 European countries, Madkour et al (2014) found that the younger participants, aged 15-19 at interview, endorsed younger age norms for first sex compared with older participants aged 31-65 years. The mean

age norm reported by younger respondents varied from 14.8 years in Germany to 17.0 years in Ukraine, and a correlation of only borderline significance was detected between age norms and the countries' legal age of consent. The wording of the ESS question is reflective of the way in which sex among young people is considered more generally – there seems to be a general discomfort in defining an *optimal* time at which to become sexually active and so, the more proscriptive categorisation of *too young* is prevalent in the literature. Statistical age norms are often applied to age at first sex; there has been interest in estimating the age by which of the majority has had sex, the median age at sexual debut, and also, concern for those whose onset of sexual activity occurs *before* the majority (Zaba et al., 2004).

Possibly the most explicit proscriptions governing the timing of sexual debut are those enshrined in law – the legal age of consent. The age of consent shows little regional consistency nor stability over time. With the exception of England and Wales, no legal minimum age for sexual contact existed in European countries prior to the 18th/19th centuries – biological sexual maturity served as the indicator of the beginning of sexual lives. The initial laws specified an age of consent of 10-12 years and by the 1920s, the age limit was 12 or 13 in the majority of European countries (Graupner, 2000). Currently within Europe the age of consent varies from 14 in Austria, Italy and Germany, to 18 in Turkey and Malta. Spain recently agree to increase its age of consent from 13 to 16. In the USA, states legislate autonomously on this issue; minimum age limits vary from 14 to 18 years old. Indicative of the countries' British colonial history, Canada, New Zealand and the majority of states in Australia have an age of consent of 16 (Graupner, 2000). In Africa, the age of consent varies from 12 in Angola to 20 in Tunisia (Bernat, 2011).

Over and above the standard minimum age of consent for sex, some countries provide a more nuanced law which attempt to criminalise older sexual predators while making it legal for younger teenagers of similar ages to engage in consensual relationships – these are known as 'close in age' or 'peer group' exceptions. Canada operates such a system, whereby under 12 years all consent for sexual activity is illegal, those aged 12 -13 years can legally consent if their partner is less than two years older and not in a position of authority over the teen, 14-15 year olds can consent if their partner is less than five years older and not in a position of trust. For other relationships, 16 is legal age of consent, unless the partner is in a position of authority or trust whereupon the legal age of consent increases to 18 (Government of Canada, 2008) - as is also the case in UK law (Sexual Offences Act, 2003).

There are also variations in the minimum legal age relating to the nature of sexual activity, sexual orientation, and gender. For example, in Canada the age of consent is higher for anal intercourse regardless of sexual orientation (Government of Canada, 2008). In Britain the age of consent

was older for acts occurring between two men than for heterosexual couples until the law was changed in 2000 (Sexual Offences (Amendment) Act, 2000).

2.4 The history of the age of consent in Britain

As discussed, public health research into sexual behaviour among young people often focuses specifically on chronological age at sexual debut. The threshold for what is classified as 'early' sex in the literature often reflects the legal age of consent in the country under study, with British studies usually selecting 16 years of age, defining those 15 and under as 'early starters'. This cut-off reflects the age at which sexual activity is deemed to be legally and socially acceptable in Britain. However, the age of consent has been an inconsistent threshold, having changed multiple times in Britain over the last few centuries.

Given widespread use of the legal age of consent as the threshold for what is considered 'early' sex in British studies, this section provides an overview of the history of the age of consent in Britain. The development of the age of consent seems to have been somewhat arbitrary, based on historical notions of the need to 'protect' young women, with more recent discussions attempting to apply scientific authority to uphold the current age of consent which was originally established almost 130 years ago. For a detailed account and analysis of the British age of consent laws see Waites (2005).

The phrase 'age of consent' is used to refer to the age at which it is legal to engage in sexual intercourse (and/or other sexual activities). However, in the late nineteenth century when the concept was increasingly being used in the English-speaking world in the context of the legal regulation of sexual activity, the phrase was primarily used in relation to the legal age at which a female could consent to sexual intercourse with a male (Waites, 2005). The first reference to a legal age of consent in English secular law appeared in 1275 as part of a law relating to rape. According to the Statute of Westminster, it was prohibited to "ravish" a "maiden within age," whether with or without her consent. The phrase "within age" has been interpreted as the age of marriage, which at the time was 12 years. A 1576 law making it a felony to "unlawfully and carnally know and abuse any woman child under the age of 10 years" was generally interpreted as creating more severe punishments when girls were under 10 years old while retaining the lesser punishment for acts with 10- and 11-year-old girls (Robertson, 2013).

In 1861, the Offences Against the Person Act stated the age of consent for all sexual behaviour between a male and a female was 12 years old in England, Wales and Ireland (Offences Against the Person Act, 1861). The Offences Against the Person Act 1875 raised this to age 13. The age of consent for sexual intercourse (vaginal penetration with penis) was then increased to 16

throughout the UK by the Criminal Law Amendment Act 1885, and a separate more serious offence of 'defilement' covered intercourse with a girl under 13 (Criminal Law Amendment Act, 1885). This was reportedly due to published accounts about the ease at which 13 year old female prostitutes could be acquired (Grayson, 2005). Due to the prevailing discourses of masculinity, it was assumed that boys required no such legal protection, and so, no minimum legal age for boys to engage in intercourse existed in UK law. The laws governing age of consent were highly gendered; based on the assumed desire and aggressive sexual agency of the male, in contrast to the passive female, who needed only to provide consent (Jackson, 1998).

Therefore, since 1885, there has been no change in the age of consent for heterosexual sex; however, the 2003 Sexual Offences Reform Bill (Sexual Offences Act, 2003) modified the law so that the 16 year age of consent applied to men, as well as women. Furthermore, the 2003 Bill also made it an offence for under-16s to engage in sexual activity – though with the additional guidance notes stating that in practice, it would be highly unlikely that young people would be prosecuted for consensual acts.

According to Waites (2005), from the late nineteenth century, debates regarding the age of consent featured little reference to models of women's decision-making competence in determining the age at which sexual intercourse with a woman became legal. Rather, the boundary was fixed at an age below which women were seen as requiring protection, as opposed to an age at which they achieved the ability to make their own decisions. This position was in accordance with the wider socio-political context; women gained few citizenship rights at 16 or at any other age - they did not have the vote, nor access to many forms of employment. Once married, women were regarded as property of men and the law assumed the legitimacy of all sexual behaviour within marriage, irrespective of consent. Furthermore, biomedical authorities emphasised an extended period of childhood sexual innocence for women, with adult females assumed to be sexually passive and lacking desire. This model was associated with understandings of women as lacking strong rational capacities in adulthood. Hence, "the current legal age of 16 was originally formulated as an age of protection for girls, with little reference to capacities for decision-making competence" (Waites, 2004) (p. 76). According to Walkowitz (1992), the age of consent was arbitrary – 'girlhood' was defined by dependency, but not by any specific stage of psychosexual development. Debates over the age of consent rarely, if ever, referred to the actual sexual development of the girls to be 'protected'. A variety of proposed ages were circulated in public debate, a fact suggestive of the lack of reference to clear boundaries which might determine women's decision-making competence.

Oral sex and masturbation remained subject to a lower age of consent until 1922, when the Criminal Law Amendment Act was passed, removing 'consent' as a defence to 'indecent assault' against persons under 16. From Waites' (2005) analysis of parliamentary debates in the 1920s it seems that the age of consent of 16, originally established 1885, provided the foundation for the subsequent reform of the law on indecent assault. Therefore the creation of a universal minimum age of 16 applying to all sexual behaviour involving physical contact derived its rationale from the protectionist perspectives of the 1880s (Waites, 2004).

In 1975 the UK's age of consent laws were reviewed by the Home Office Policy Advisory Committee on Sexual offences. No change to the age of 16 for sexual consent laws was recommended (though a reduction for male-male sex from 21 to 16, was suggested) (Policy Advisory Committee, 1981).

The committee recited several arguments in favour of keeping the age of consent at 16 years:

- Physical harm which may arise from premature sexual experience and the undesirability of pregnancy at too early an age.
- Increased risks of cervical cancer
- Risks of complications in pregnancy and the adverse effects of abortion upon the future fertility of girls under 16.

These arguments relied on a highly medicalised view of adolescence in order argue against lowering of the age of consent. Rather than exploring the way in which the social conditions and availability of resources could be optimised in order to enable young women to demonstrate autonomy and make informed choices, they focus on the body, and the apparent physiological constraints of the immature female engaging in sexual activity. While these arguments represent a very reductionist view of the potential harms of sex that occurs too early, there is limited evidence for the heightened risk of under-16s suffering from these health complications.

While teen pregnancy is often considered a public health problem, studies suggest that associations between teen motherhood and poor biological outcomes such as anaemia, pregnancy induced hypertension, low birthweight, prematurity, intra-uterine growth retardation and neonatal mortality, are "predominantly caused by the social, economic, and behavioural factors that predispose some young women to pregnancy" as opposed to the age at which the pregnancy occurred (Cunnington, 2001). Research with teenage mothers has also highlighted that for some, motherhood is a positive experience which can provide the motivation to take up education, training and employment (Duncan, 2007). Furthermore, the

suggestion that abortion has adverse effects on future fertility is not supported by the research literature (Frank et al., 1993; Thorp et al., 2003; Rowlands, 2011).

An association between younger age at first sex and cervical cancer has been identified by multiple studies, but the importance of *age* per se is not well understood. While some studies have attributed this to the 'immature' cervix being more susceptible to HPV infection (Ruiz et al., 2012), others have posited that the relationship is to do with the association between younger age at first sex and behavioural factors such as number of partners and unprotected sex (Kahn et al., 2002b) – the relative contribution of these two mechanisms is difficult to quantify.

In addition to the apparent potential for physiological harm, the committee highlighted the “emotional and social harm which a girl may suffer when she has sexual relations at an age when she is not mature enough to cope with the consequences of a sexual relationship” (Policy Advisory Committee, 1981) (p. 6). The committee explicitly differentiated between psychological maturity and physiological development: “although there had been a gradual fall in the average age at which menarche occurred in girls, there had been no significant increase in recent times in the level of psychological maturity of girls under 16” (Policy Advisory Committee, 1981)(p. 7).

In line with their approach to justifying 16 from a medicalised and physiological standpoint, the age of 16 was presented as an age of psychological maturity with reference to medical and psychological expertise, though Waites (2004) argues:

“While the degree of maturity required was discussed in the context of a complex discussion of various aspects of the social and cultural context apparent in the committee’s reports, the rationale for the age of 16 was not directly theorised or justified in relation to this context, but rather was asserted alongside invocation of evidence from the British Medical Association and the Royal College of Psychiatrists. Medicine thus provided the review with a form of expertise which could define a particular age of psychological maturity at the age of 16 [...] The claims advanced by the medical profession and psychological sciences concerning the age of consent were unsophisticated, heterogeneous and relatively cautious. The emphasis placed upon medical and psychological evidence by the committee can therefore be interpreted as a pragmatic strategy, an attribution of authority in order to rationalise and lend support to the committee’s conclusions. Thus the review suggests not a straightforward assertion of medical and psychological authorities, but a more mediated appropriate of these authorities.” (Waites, 2004) (p. 78-79)

Therefore, due to the attribution of authority to the medical and psychological sciences, the legal age of 16, which was originally determined in late 19th century, was revalidated with a new rationale that lacked in substantive basis. Despite this lack of evidence-based underpinnings to the age of consent, this socio-legal normative cut-off of 16 has been employed widely for defining the appropriateness of the onset of sexual activity in public health research.

2.5 A competence-based approach

‘Sexual competence’ represents a more sophisticated measure of sexual behaviour and sexual health among young people, making way for the discussion about timing of first sex to take place within a broader framework concerned with the characteristics and experience of the sexual encounter itself, as opposed to a focus on age at occurrence. This shift in the conceptualisation of the timing of first sex is also illustrated by the recent emergence of research focussing on the context and affective experiences of young persons’ sexual encounters and their relevance for healthy sexual development (Wight et al., 2008; Higgins et al., 2010; Reissing et al., 2012).

Such an approach may also be more consistent with young people’s priorities regarding the timing of first sex. In a qualitative study of young people’s perspectives of the age of consent in England and Northern Ireland, (Thomson, 2004) (p. 143) it was apparent that for these respondents, it was not considered important that sex is ‘legal’ in terms of age, but the legitimacy of engaging in sexual encounters was located in the notion of ‘readiness’. What being ready for sex actually meant had no consistent definition, but this allowed flexibility for accommodating differences between individuals: “for one person being ready might mean being informed and not under pressure, while for another it could mean being in a committed and stable relationship confident and informed enough to practise safer sex” (Thomson, 2004) (p. 143).

The concept of competence has previously been used in sexual behaviour research but it has tended to be described according to a small number of mainly biomedical dimensions; for example, contraceptive use (Ingham and Van Zessen, 1997), or in specific contexts such as sex abuse (Helweg-Larsen et al., 2004) or disability (Murphy and O’Callaghan, 2004).

An assessment of the capabilities and behaviour of the individual for determining competence is not a new idea. The law and the medical profession provide guidelines for assessing the ‘competence’ of young people below the age of 16 who wish to make their own decision about medical treatment – and this also extends to the request for contraception. At 18, a young person enjoys the same degree of autonomy in healthcare matters as any other adult, and to a more limited extent 16 and 17 year olds can make decisions regarding their own healthcare independently of their parents. However, the right of younger individuals to provide independent consent is proportionate to their competence – with the law and medical professional recognising that a child’s age alone is an unreliable predictor of his or her competence to make decisions (Wheeler, 2006). Clinicians are expected to assess the

competence of a young person according to the 'Gillick test'. The 'Fraser guidelines' are also used to assess competence, but are narrower and relate specifically to contraception. The Department of Health's Best Practice Guidelines for doctors and other health professionals on the provision of contraceptive advice and treatment to young people under 16 (Department of Health, 2004) specify that young people should be enabled to make an informed choice by discussing the following:

- The emotional and physical implications of sexual activity, including the risks of pregnancy and sexually transmitted infections.
- Whether the relationship is mutually agreed and whether there may be coercion or abuse.
- The benefits of informing their GP and the case for discussion with a parent or carer. Any refusal should be respected. In the case of abortion, where the young woman is competent to consent but cannot be persuaded to involve a parent, every effort should be made to help them find another adult to provide support, for example another family member or specialist youth worker.
- Any additional counselling or support needs.

These guidelines acknowledge that there are criteria, independent of chronological age, which may be used to assess the nature and appropriateness of young persons' sexual activity, and therefore their right to access contraception.

2.6 Research on age at first sex

As described above, chronological age at first sex has been a primary concern of public health research. Substantial regional variations in age at first sex exist globally (Bearinger et al., 2007; Singh et al., 2000). Among women, median age at first sex is lowest (around 15.5 years) in countries where early marriage is the norm, such as Central and West Africa, and highest (around 18.5 years) in Latin American and Caribbean countries. For men, age at first sex is not generally linked to age at marriage and occurs later than their female counterparts – particularly in less developed countries (Wellings et al., 2006). Trends toward later marriage in the last few decades had led to a reduced proportion of women engaging in sexual intercourse before the age of 15 in developing countries, while some industrialised countries have witnessed an increase in transition to sexual activity at younger ages (Wellings et al., 2006). An analysis of successive cohorts in Britain indicates that the proportion of young men and women becoming sexually active before age 16 has increased to around one-third over the last 50 years (Mercer et al., 2013).

'Early' sexual debut does not have a stable definition in the academic literature. Research into sexual behaviour in African countries has primarily classified sex before 15 as 'early' (Harrison et al., 2005; Peltzer, 2010), while in Western countries the cut-off is usually 16 years (Valle et al., 2005; Klavs et al., 2006; Paul et al., 2000).

2.6.1 Age at first sex as an outcome

Given that 'early' sexual intercourse is considered a poor outcome in itself, many studies have been conducted to identify the precipitating factors associated with age at first sex. A vast range of factors have been found to be associated with early onset of sexual activity (Zimmer-Gembeck and Helfand, 2008). An earlier onset of puberty, commonly indicated by age at menarche among women, has been found to be associated with earlier sexual debut (Wellings et al., 2001; Kim and Smith, 1999) – both of these events are often drawn upon by studies concerned with the evolutionary perspective that hypothesises early childhood stressors lead to a speed up in life history events, from puberty, to first sex, and first birth (Belsky et al., 1991).

A great deal of attention has been given to identifying the social and environmental factors associated with age at first intercourse. Earlier first sex has been found to be associated with having a younger mother (Henderson et al., 2002; Wight et al., 2006), disrupted family structure – not living with both natural parents (Wellings et al., 2001; Henderson et al., 2002; Lenciauskiene and Zaborskis, 2008), and low parental monitoring (Lenciauskiene and Zaborskis, 2008; Wight et al., 2006). Studies have also examined the impact of communication with parents about sex, finding mixed results – Wight et al., (2006) found increased comfort talking to one's father about sex was associated with reduced likelihood of early sex among females – this specific association was also found in analyses of the England Health Behaviour in School Aged Children (HBSC) survey (Lenciauskiene and Zaborskis, 2008), however, in analysis of Natsal-2 data, whether or not respondents had discussed sex with their parents was not associated with sexual debut before 16 (Wellings et al., 2001) – perhaps suggesting that the ease of discussion, as opposed to whether or not it occurred, is more important.

Various indicators of socio-economic status have been linked to timing of first sex. Analyses of the SHARE study's 14 year old Scottish sample found that respondents whose parents were of lower social class were more likely to be sexually active (Henderson et al., 2002), while analyses of Natsal-2 data found lower educational level of the respondent to be associated with sex before 16, with no significant association observed with parental social class in adjusted analyses (Wellings et al., 2001). Associations with ethnicity have also been identified - among an ethnically diverse sample of 16-18 years old in London, Black men and White British women

were most likely to report sex before 16, while Asian respondents were the least likely to report 'early sex' (Coleman and Testa, 2007).

School sex education was found to be associated with age at first sex in Natsal-2 analyses, whereby respondents who reported that their 'main' source of sex education was school were significantly less likely to report first sex before 16, compared with respondents who reported other main sources, such as friends or media (Wellings et al., 2001). Various studies assessing the impact of specific sex education programmes, compared with the usual sex education, did not find any significant effect of these interventions in terms of delaying the onset of sexual activity (Blenkinsop et al., 2004; Wight et al., 2002). Young person's dislike of school has also been shown to be associated with early sexual debut (Bonell et al., 2005; Parkes et al., 2014).

Despite chronological age arguably being a relatively crude indicator of the nature of first sex, much of the cited research finds that younger ages at first sex are significantly associated with a range of background variables that are probably indicative of more negative contexts – such as disrupted family structure and lower socio-economic status. Research that focuses on the cut-off of 16 in defining early sex finds that this age threshold does distinguish between young people of differing characteristics. This indicates that although the origin of the age of 16 as a defining threshold for first sex was rather arbitrary, it does appear to be a meaningful cut-off point in public health research.

2.6.2 How researchers justify their focus on predicting 'early' first sex

Researchers focussing on the identification of antecedent factors associated with age at first sex provide a range of justifications for why the outcome of 'early' sexual debut is important. By examining the introductory paragraphs of a range of relevant articles we can identify the rationale behind the selection of 'early' first sex as the outcome of interest. Probably the most commonly cited justification is that previous research has found an association between earlier sexual debut and subsequent poorer physical sexual health, such as STIs (Cuffee et al., 2007; Crockett et al., 1996; Lenciauskiene and Zaborskis, 2008; Valle et al., 2005; Price and Hyde, 2009; Collins et al., 2004; Rosenthal et al., 2001; Felton and Bartoces, 2002; Gray et al., 2008; Pearson et al., 2012; Lammers et al., 2000; Sieving et al., 2006), unplanned pregnancy (Cuffee et al., 2007; Lenciauskiene and Zaborskis, 2008; Collins et al., 2004; Gray et al., 2008; Lammers et al., 2000), the 'problem' of teenage pregnancy (Crockett et al., 1996; Valle et al., 2005; Price and Hyde, 2009; Felton and Bartoces, 2002; Sieving et al., 2006), and behaviours which are known risks factors for these physical threats to sexual health, such as multiple partners (Cuffee et al., 2007; Lenciauskiene and Zaborskis, 2008; Mårdh et al., 2000; Price and Hyde, 2009; Gray et al., 2008; Pearson et al., 2012; Sieving et al., 2006) and more occasions of unprotected intercourse (Cuffee

et al., 2007; Price and Hyde, 2009; Gray et al., 2008; Sieving et al., 2006). Other researchers have also noted the association between early sexual debut and social problems as a reason for their focus on the predictors of early first intercourse (Pearson et al., 2012; Lammers et al., 2000). There seem to be far fewer studies describing the importance of age at first sex in terms of its association with a particular context of sexual debut – Henderson et al.'s. (2002) study is an exception, with introductory paragraphs presenting evidence showing that individuals who have first sex at younger ages are more likely to have had a non-consensual, regretted, and unprotected (by contraception) first encounter. Few other studies have articulated a similar rationale concerned with immediate context of first sex (Collins et al., 2004; Rosenthal et al., 2001).

An overview of research examining the association between age at first sex and subsequent sexual health is provided in the next section.

2.6.3 Age at first sex and subsequent sexual health

While age at first sex is considered an important outcome in itself, researchers have also been interested in whether subsequent health is associated with the timing of sexual debut. Wellings et al., (2001) found no significant association between sex before 16 and self-reported STIs among 18-24 year men and women in adjusted analyses, while a multi-country study including a British sample found no relationship between age at sexual debut and current Chlamydia infection (Mårdh et al., 2000). In analyses of the most recent Natsal-3, sexual debut before age 16 was associated with testing positive for high-risk HPV among women in crude analysis, though this association did not retain significance one adjusted for other variables (Sonnenberg et al., 2013).

Studies in other developed countries have found evidence of such an association: analyses of the US National Longitudinal Study of Adolescent Health showed younger age at sexual debut was associated with a greater likelihood of testing positive for an STI, but this effect weakened as current age increased (with no association at age 24), providing evidence for a relationship which dissipates with time (Kaestle et al., 2005). Sexual debut before 16 was found to be a predictor of HSV-2 acquisition between the ages of 21 and 26 in a longitudinal cohort study in New Zealand, and this remained significant when adjusting for number of partners in last 5 years (Eberhart-Phillips et al., 2001). Kahn et al (2002b) found early first sex to be associated with HPV infection among US female students.

With reference to pregnancy outcomes, sex before 16 has been found to be associated with motherhood before 18, abortion before 18 (Wellings et al., 2001) and unplanned pregnancy (Wellings et al., 2013) in British population-based studies.

Despite the association found between younger age at first sex and subsequent sexual health, little is known about the potential mechanism which might explain these findings. The mechanism is important as it is unlikely that the act of having sex at a particular chronological age causes those people to be at greater risk of poor sexual health – though the way in which this research is drawn upon by studies identifying predictors of early sex implies a belief that in delaying first sex to an older age, the subsequent poorer sexual health will be avoided. A potential explanation of the associations observed is that unmeasured/unknown individual characteristics and/or background factors account for both the earlier transition into sexual activity and the subsequent engagement in behaviour that increase the risk of poor sexual health outcomes.

2.7 Research on the context of first sex

The experience of first sex and context in which it occurs has been explored in British qualitative studies, which are able to provide us with insights into which aspects of first sex are important to those young people engaging in it. Probably due to the open discussion arising in qualitative studies that are not constrained by survey questions, information relating to the context of first sex is abundant.

Reflections on the reasons for first sex are reported – particularly the pressure that comes from the perception that ‘everyone else was doing it’ (Hyde et al., 2008) or feeling that sexual intercourse is normal ‘natural progression’ within a relationship (Holland et al., 2000). Pressure from the partner, whether explicit or subtle, is also a common theme arising particularly in girls’ accounts of first sex, while men more commonly talk about pressure from friends (Hyde et al., 2008; Ingham et al., 1991).

How participants felt after their first sex was also a recurring topic. In a study which presented UK college students with hypothetical first sex scenarios in which no condom was used, the anxieties expressed by the young women related much more to their feelings and worries after sex about the relationship with the partner, as opposed to concerns about the threat to their physical sexual health (Bromnick and Swinburn, 2003). These findings were supported by other studies of young people living in Britain – with women more likely to express regret about how or with whom the intercourse took place, while men, in general, were more likely to just be happy that they had had sex (Ingham et al., 1991; Holland et al., 2000).

Compared to those focused on age at first sex, there are relatively fewer quantitative British studies concerned with the context of sex. While contraceptive use is quite commonly measured, the social and emotional aspects of the encounter are often omitted, though it is evident from studies employing qualitative methodologies that these issues are of importance to young people when they are given the opportunity to talk freely about their first sex.

In Blenkinsop et al's., (2004) evaluation of a package of work to improve the provision of Sex and Relationship Education in Schools - the APAUSE (Added Power and Understanding in Sex Education) programme – the outcomes of interest included not only age at first sex, but also contraceptive use, and regret about first sex – although no differences were observed in these between schools that implemented the APAUSE programme and those that did not. Contraceptive use at first sex was more likely among respondents who expressed aspirations to attend university and those who had an 'open' relationship with their parents, and less likely among those with low self-esteem. Female respondents were more likely to express that they wished they had waited longer before having sex, compared with men.

Similarly, authors using data from the SHARE and RIPPLE sex education trial considered other contextual indicators alongside age at first sex – these included pressure at first sex (which was found to be more common among female participants and less so among participants who reported higher levels of parental supportiveness) and contraceptive use (which was associated with prior discussion about contraception with partner, less pressure from male partner, planned intercourse, stable relationships status, not being drunk, and greater reported parental supportiveness and monitoring) (Henderson et al., 2002; Parkes et al., 2011). Wight et al., (2008) also explored the distribution of the following factors relating to first sex in the sample: relative age of partner, relationship with partner, planning for sex, drunkenness/drug use, and regret.

A British study of an ethnically diverse sample of respondents in London also reports on contextual aspects of first sex, alongside age, based on the same questions asked in the Natsal surveys relating to relationship status, autonomy of decision, timing, relative willingness, and contraceptive use (Coleman and Testa, 2007). They found that a negative reason for first sex was most commonly given by male respondents, while women were generally more likely to report regret – particularly those of Black African ethnicity. The reporting of unequal willingness of partners was generally higher in the black and ethnic minority groups, compared to those of white ethnicity, and a similar pattern was observed for the non-use of contraception.

2.7.1 The association between context of first sex and age at first sex

Studies have generally found that younger age at first sex is associated with sexual debut occurring in a more negative context. Wellings et al. (2001) found that male and female respondents who were younger at first sex were more likely to wish that they had waited longer before having sex and were less likely to have used a reliable method of contraception. Among women only, younger age at first sex was also associated with an increased likelihood of reporting that their partner was 'more willing' and citing peer pressure as the main reason for engaging in sex. The associations between age at first sex and regret and contraceptive use were also identified in a study of Irish youth (Schubotz et al., 2004), while Wight et al., (2008) also found younger age at first sex to be associated with increased reporting of pressure at first sex and regret. In contrast to the majority of studies which focus on absolute age of the individual at first sex, Mercer et al., (2006) examined influence of pronounced age differences between the partners at first sex, finding that those who had a relatively older partner (above the 95th percentile of age difference) were more likely to have reported that their partner was more willing at first sex, to have given a non-autonomous reason for first sex, and were less likely to have used a condom.

The associations observed between younger age and negative contexts of first sex could be due to a number of factors. Being a younger teenager in a social context that is overtly disapproving of the idea of people engaging in sexual activities at younger ages, may limit teens' real or perceived access to advice and services and the extent they are able to develop and demonstrate sexual autonomy (Aggleton and Campbell, 2000).

2.7.2 Subsequent sexual health and context of first sex

There seem to be relatively fewer studies attempting to explore the link between the context of first sex and subsequent sexual health, compared with those that focus on the predictive effect of age at first sex. The only British studies concerned with the association between the context of first sex and subsequent sexual health are those that analysed data from the Natsal surveys and used the measure of sexual competence at sexual debut – which are discussed in Section 2.8.2 below (Wellings et al., 2001; Mercer et al., 2005; Wellings et al., 2013; Mitchell et al., 2013).

The international research literature provides some evidence for an association between the context of first sex and subsequent sexual health and behaviour. In a Slovenian population-based study, men who reported condom use at sexual debut were 11 times more likely to report consistent condom use in the 4 weeks preceding the interview, and the equivalent odds ratio for women was 2.5 (Klavs et al., 2005). An analysis of the US National Longitudinal Study of Adolescent Health produced similar results of an association between condom use at sexual

debut and condom use at most recent sex among 18-26 year olds (Shafii et al., 2007). One study attempted to explain the mechanism underlying the positive association between condom use at first sex and condom use at subsequent sexual encounters and found evidence supporting their hypothesis relating to habit formation (Stulhofer et al., 2010).

Regarding more emotional and social dimensions of first sex, a few studies have attempted to identify whether these are linked to subsequent health. In an analysis of the retrospective reports of 475 Canadian undergraduate students (age range: 18-29), Reissing et al (2012) found that positive current sexual adjustment was significantly associated with positive affective reaction to first sexual intercourse among both men and women. The respondents reaction to first intercourse was measured using the *First Coital Affection Reaction Scale* (FCARS), a measure consisting of thirteen items, including satisfaction and guilt, rated on a 7 point Likert scale with high scores indicating more negative experiences of first coitus (Schwartz, 1998) and their current sexual adjustment was measure using *The Sexual Aversion Scale* which assesses respondents on 30 items relating to their sexual fears and avoidant behaviours (Katz et al., 1989). Mediation analysis indicated that this relationship between affective reaction to first sex and current sexual adjustment was mediated by what the authors referred as 'sexual self-efficacy', among both genders. However, the measure of self-efficacy used was actually more reminiscent of a measure of sexual functioning: the *Sexual Self-Efficacy Scale for Female Functioning/ Erectile Functioning* (Bailes et al., 1998; Fichten et al., 1998). Therefore, it more accurate to conclude from this study that the relationship between positive current sexual adjustment and a positive affective reaction to first sexual intercourse observed was mediated by sexual functioning.

Using data from the National Health and Social Life Survey conducted in the United States in 1992 with 3432 participants aged 18-59, Else-Quest et al. (2005) classified their participants as having had their first sexual experience in a negative context if any of the following criteria applied: first intercourse was forced; was with a blood relative; was with someone who paid the participant to have sex; the main reason the participant chose to have first intercourse was peer pressure or the influence of drugs or alcohol; or the participant reported having been touched sexually by an adult prior to puberty. Additionally, female respondents were also classified as having had a negative first sexual experience if first intercourse occurred with a stranger; someone they had just met; or with someone who they did not know well. Analyses found that a negative context of first sexual experience was associated with sexual dysfunction, more sex guilt, poorer general health, experience of STIs, and poorer life satisfaction.

A study of 331 US undergraduate students also found evidence that the experience of first sexual intercourse has implications for subsequent sexual functioning (Smith and Shaffer, 2013). Respondents were asked to fill in an online diary within in eight hours of any intimate interaction (defined as an intimate interaction in which the purpose was sexual arousal, not limited to sexual intercourse). The online diary asked respondents to rate how they felt during and after the interaction on 23 dimensions, which were reduced down to four factors using factor analysis: positivity during interaction (feeling intimate, desired, respected, loved, capable, and aroused), negativity during interaction (feeling pressured, incompetent, anxious, and detached), positivity after the interaction (feeling relaxed, good, and exhilarated), and negativity after interaction (regret, guilty, disappointed, and ashamed). In addition, questions related to physical and emotional satisfaction were asked. Similarly, participants were asked to rate how they felt during and after their first ever sexual intercourse on 26 dimensions, which were reduced down to four factors: anxiety (scared, nervousness during, nervousness after), afterglow (relaxed, content, good, excited, confident, proud, relieved), negativity (pressured, confused, detached, regret, guilt, disappointment, ashamed), and connection (intimate, desired, in control, respected, loved, capable, and aroused). Participants were also asked to rate their emotional and physical satisfaction at first sex.

Analyses found that those who experienced greater physical satisfaction at first sex have current sexual interactions characterised by greater physical satisfaction. Similarly, emotional satisfaction at first sex was predictive of greater emotional satisfaction with current sexual interactions. Associations were also identified between the four derived factors: first sex negativity predicted current negativity during and after sexual interactions, while first time 'afterglow' was associated with positivity after the current interactions. In general, this study found that even when controlling for overall sexual satisfaction, the experience and feelings about first sex had implications for the experiences of subsequent sexual interactions, with negative experiences of first intercourse being associated with negative feelings about current sexual encounters, and positive accounts of first intercourse being predictive of more positive experiences in current sexual interactions. These findings prompted the authors to speculate that "first-time sexual experience is so salient that it is related to future sexual satisfaction and functioning, specifically through long-lasting sexual schemas[....]any schemas and scripts developed during the first time may continue to influence sexual intercourse later in life" (Smith and Shaffer, 2013)(p.107-108).

Moore and Davidson's (1997) study of 570 never-married college women identified that feelings of guilt about their first sexual intercourse experience were significantly associated with a greater likelihood of current psychological sexual dissatisfaction and guilt feelings about current

intercourse. However, these findings should be interpreted cautiously – the study identified a number of family-related factors that were predictive of guilt feelings about first intercourse – though these were not adjusted for in the analysis of the relationship between first sex guilt and current sexual adjustment.

A study of 899 Greek women aged 19-44 years found that experiencing less pleasure than expected at first sex, and first sex being painful, were both associated with their emotional and behavioural reactions to subsequent sexual relationships – whereby they were more likely to experience fear and sexual unresponsiveness in later sexual encounters (Papaharitou et al., 2011). However – again this study was methodologically flawed, with no statistical adjustment for potential confounders to the relationships observed.

These studies provide evidence that the experience and context of first sexual intercourse, and not just age at occurrence, may have implications for subsequent sexual health and functioning. However, it should be noted that they all rely on retrospective reporting, so that the associations observed may be a product of recall bias; respondents who currently enjoy a positive and well-adjusted sex life may be more inclined to recall their first sexual experiences in a more positive light.

2.8 Sexual Competence in the Academic Literature

This PhD focuses on the concept of sexual competence which was first operationalised by Wellings et al (2001) in the second National Survey of Sexual Attitudes and Lifestyles (Natsal-2). Based on self-reports, a respondent was classified as sexually competent at heterosexual sexual debut if they reported each of the following conditions of first sex: consensuality (both partners 'equally willing'), autonomy (not influenced by peer pressure or alcohol/drugs), acceptable timing (that it happened at the 'right time'), and the use of a reliable method of contraception (condom and/or pill).

The terms sexual 'competence' and sexual 'readiness' are often used interchangeably in the literature. Given that neither sexual competence nor sexual readiness has any established definition, there is little to determine whether they are conceptually different. A literature search for "sexual competence" and "sexual readiness" as phrases and as independent words was conducted in PubMed, Popline, Embase, Adolec, IBSS and Web of Knowledge. Of the resulting articles, very few were relevant to the concept of sexual competence that is of interest to this PhD, those that were are reviewed.

2.8.1 Discussion and review papers relevant to 'sexual competence'

Hirst (2008) uses the term 'sexual competence' as referring to the "ability to be involved in sexual practices with successful processes and outcomes" (p.6). The successful outcome posited by Hirst is that of a positive sexual experience which reflects the WHO definition of sexual health; i.e. maintaining physical health through the avoidance of STIs and unintended pregnancy, and also emotional health through having enjoyed the experience through deriving pleasure and minimal or no regret. Hirst also considers the 'processes' necessary to achieve these outcomes, with reference to interactional process:

"pleasure and/or no regret might derive from participation in a process of sexual practice that is chosen, satisfying, and involved emotional connection and negotiation over non-penetrative safer practices or the effective use of condoms [...] a 'positive' outcome would exclude post-sex worries over contracting STI and/or conception, having no regrets over the person or the circumstances in which sex took place, and having not been coerced or acted against one's will" (p. 7)

The discussion of what sexual competence entails includes all those aspects tapped into by Wellings et al.'s measure, but goes further to include the experience of pleasure – the nature of this pleasure is accepted to differ according to circumstance whereby those at the start of their sexual careers and/or relationship may experience a sexual encounter that is "emotionally desired and enjoyed but not yet physically pleasurable (because of naiveté in technique, for instance) but nevertheless judged as positive overall" (p.7). The author argues that relative variations such as these are "important to highlight in order to resist a sense of competence in research enquiry that is absolute, i.e. either 'achieved' or 'not achieved'" (p.7). Though the Wellings' measure of sexual competence does judge sexual competence in an absolute manner – that an individual was either competent or not – this applies only to one particular sexual encounter – when sexual intercourse occurred for the first time.

Hirst's reference to the importance of the 'interactional process' in achieving sexual competence mirrors the concept of 'interactional competence' in the sexual process as discussed by Vanwesenbeeck et al (1999). The authors argue that the many factors observed to be associated with sexual risk outcomes actually work through the effect they have on the interactional competence of the interacting sexual partners.

"By the concept 'interactional competence' we mean a complex of communicative and social skills, capacities, sensitivities and mental and behavioural strategies that help people to arrange their heterosexual encounters in a mutually rewarding way. Interactional competence is the ability to achieve personal goals in social (in this case sexual) interaction while simultaneously maintaining positive relationships with others. The result of interactional competence is a 'working consensus' between both partners in which both partners' goals are adequately represented." (p.28)

"Aspects of interactional competence that have been mentioned are, for instance, pre-planning, timely and clear discussion of contraceptives, knowing how to use a condom, assertive behaviour and knowing how to set one's limits, the articulation of desires, empathy for one's partner and the capacity to 'tune in', the capability to control oneself, being able to deal with conflict, sensitivity to the 'needs' of a specific situation, sensitivity to the needs of specific partners etcetera. Competence cannot exist irrespective of a partner's wishes; it is crucial that a 'working consensus', in which both partners' wishes are represented, is reached." (p.42)

"Interactional (in)competence has many faces, and what is competent in a specific situation will be dependent on many factors. A general communicative competence and sensitivity for the partner seem to be important in relation to both condom use and the prevention of [sexual] aggression; however, the former may ask for different specific skills and capacities than the latter. The criteria for, and exact definition of, competence depend on the outcomes one is interested in, for example, safe sex or pleasurable sex." (p.42)

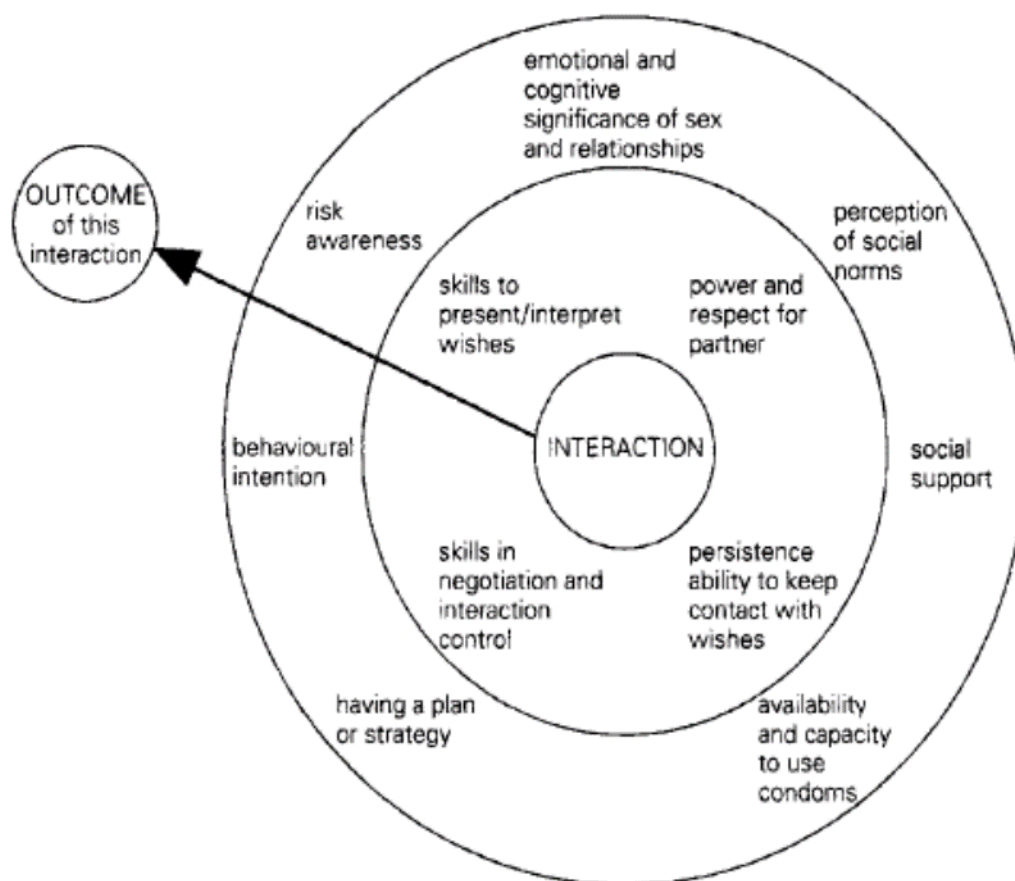
These aspects follow closely with the components of sexual competence as defined by Wellings et al (2001). Should an individual embody the aspects of interactional competence described by Vanwesenbeeck, then we would expect them to act in a way that fulfils all of Wellings' conditions for sexual competence.

These authors provide a more flexible notion of competence, noting that different situations may require different 'competencies' for example, engaging in a 'safe' one night stand will demand distinct skills and strategies to those required in a longer stable relationship when the partners are trying to keep their relationship sexually interesting. This flexible concept allows the specific definition to change according to the specific goals of the partners engaging in the sexual encounter. This is in contrast to the measure of sexual competence by Wellings et al, whereby the interaction of interest is limited to that of the first sexual intercourse and the specific goal indicative of the demonstration of sexual competence has been defined by researchers – a first sex encounter characterised by no less than each of the following conditions: equal willingness, autonomy of decision, acceptable timing, and contraceptive protection. This static operationalisation allows easier measurement of a hypothesised concept which may or may not apply to the individuals under study.

Another paper, by two of the authors contributing to Vanwesenbeeck's article, also discusses the need for a focus on 'interactional functioning' which they intermittently refer to as 'competence' (Ingham and Van Zessen, 1997). They provide a graphical representation of the structure of interaction (Figure 1), "In the centre (the arena) is the interaction. The focus of interest is any event described as occurring during the interaction that has any relevance whatsoever to the outcome of interest which is defined as safer sex (including the use of condoms)" (p.96). While the explicit focus of the authors seems to be that of condom use, the model provided is also compatible with the sexual interaction conforming to each of the

conditions specified by Wellings et al's concept of sexual competence, for example, skills in negotiation and interaction control will be important for ensuring sex only occurs when both partners are equally willing.

Figure 1: Ingham and Van Zessen's (1997) representation of interactional functioning or 'competence'



2.8.2 Empirical studies of 'sexual competence'

Gross (2009) conceptualises and measures what he terms as 'sexual competence' following a more clinical reductionist view of sexual health, focusing on behaviours which he identifies as putting young people at risk of STIs/HIV and unintended pregnancy. The behaviours were: (a) not drinking or being intoxicated at first or most recent intercourse, (b) not using drugs at first or most recent intercourse, (c) not engaging in anal sex, (d) using birth control all of the time, (e) not having sex for money or drugs, (f) not having casual sex, and (g) having had only one sexual partner. The resulting measure is based on a scale of 0 (sexual risk-taker) to 7 (sexually

competent), whereby the non-engagement in certain 'risk' behaviours increases that individual's level of sexual competence.

Gross admits the methodological weakness in that each of these behaviours does not confer an equal degree of risk for contracting STIs/HIV or an unintended pregnancy. Despite adhering to a clinical definition of sexual health, some of these measures are somewhat loaded in terms of the social acceptability of the behaviour; 'casual sex' (also described as 'non-romance sex') is not alone a risk factor for STI transmission. Whether a sexual encounter is romantic or not does not affect the likelihood of STI transmission; the use of a condom and sexual history of the partner does. This measure reflects the socially constructed conditions which are deemed necessary for sex to be acceptable; the inclusion of 'romance' being one. While the questions regarding intoxication and having sex for money touch upon aspects of autonomy and coercion, they are quite extreme examples and do not assess the more common influences of, for example, peer pressure or the desire to please one's partner.

While Gross' reductionist conceptualisation of sexual competence is not wholly compatible with the broader nature of sexual competence proposed by this PhD, his emphasis for the need of "a focus on sexual health rather than a sole focus on sexual behaviour that involves two attributes – the prevalence or absence of intercourse," (p.34) is very much in line with premise of this thesis.

As described above, Wellings et al (2001) introduced the most notable and widely used measure of sexual competence based on self-reports of the conditions of first heterosexual intercourse and this measure is the primary focus of this PhD. A respondent was classified as sexually competent at first sex if they reported that their first heterosexual intercourse was characterised by each of the following: equal willingness of partners, autonomy of decision, acceptable timing, and contraceptive protection (survey questions detailed in Figure 2). This measure was developed rather opportunistically by Kaye Wellings and colleagues, based on their assessment about what constituted a healthy first sexual encounter, informed by more holistic definitions of sexual health (WHO, 2006), and Roger Ingham's work on the concept of 'interactional competence' (Ingham and Van Zessen, 1997). Rather than taking a bottom-up approach and building a psychometrically-validated measure, the development of the concept known as 'sexual competence' has to an extent occurred in reverse – with the measure seemingly defining the nature of the concept. References to sexual 'competence' and 'readiness' in both the academic literature and even NHS-endorsed advisory materials often present a definition of these terms that is largely based on the content of the measure that was developed and used in the Natsal surveys (Heron et al., 2013; NHS website, 2009).

The authors used the measure as an explanatory and outcome variable when analysing data from Natsal-2. Sexual competence at sexual debut was found to be correlated with age at sexual debut among respondents aged 16-24 at interview (Table 1). Although a correlation between age at sexual debut and sexual competence was found to exist, age did not account for all the variance in sexual competence, providing further evidence that chronological age is an overly simplistic indicator of the appropriateness of sexual activity. Wellings et al (2001) also found respondents who had a lower level of education and those who reported the main source of sex education to be 'friends' or 'other' were significantly less likely to have been sexually competent at first sex.

Table 1: Proportion (95% CI) of respondents who were sexually non-competent at sexual debut by age at sexual debut and gender (data from Wellings et al. 2001)

	Age at first sex				
	13-14	15	16	17	18-24
Men	66.6 (58.0-74.2)	46.6 (38.2-54.8)	43.2 (36.3-50.4)	38.0 (30.1-46.6)	38.6 (31.8-45.9)
Women	91.1 (85.3-94.7)	62.4 (55.1-69.1)	49.7 (43.9-55.6)	48.6 (40.7-56.6)	36.6 (29.4-44.4)

The association between the Natsal measure of sexual competence at first sex and subsequent sexual health has only been explored by a few studies using data from Natsal-2 and Natsal-3 – and none of these have conducted devoted analyses focusing on the predictive ability of the measure. Mercer et al., (2005) identified that sexual non-competence at first sex was significantly associated with having experienced 'any' (lasting more than one in month in the last year) or 'persistent' (lasting more than 6 months in the last year) sexual function problems among respondents aged 16-44. Adjusted odds ratios ranged from 1.28-1.63 and 1.34-1.55 among male and female participants, respectively. In contrast, Wellings et al. (2001) analyses of the Natsal-2 data found no statistically significant association between sexual competence at first sex and self-reported STIs, among 18-24 year old respondents.

Analyses of the most recent Natsal-3 data found lack of sexual competence at first sex to be associated with unplanned pregnancy among women aged 16-44 at interview – participants who were not sexually competent at first sex were 1.90 times more likely to have experienced and unplanned pregnancy in the last year, compared with those who were sexually competent at sexual debut (Wellings et al., 2013). Lack of sexual competence was also associated with low sexual functioning among 16-74 year olds who had has sex in the year prior to interview – lack of sexual competence at first sex was associated with 1.33 and 1.71 greater odds of low sexual functioning among men and women, respectively (Mitchell et al., 2013). In both of these studies,

the analyses were only adjusted for participants' age and no other potentially confounding factors.

In a study of ethnically diverse 15-18 year olds in London, a measure of sexual competence at first sex was constructed based on the Natsal measure, but with the additional criterion that respondents had to report being in a 'steady' relationship at first sex in order to be classified as sexually competent. This study found a greater proportion of young people to have been lacking in sexual competence at first sex (80% of men and 71% of women), compared with Natsal-2 results – perhaps due to the nature of the sample – younger age and from schools where the majority of students were from BME communities – and due to the extra criterion of relationship stability added to the measure (Testa et al., 2006).

This additional criterion of being in a steady relationship at first sex seems to represent what circumstances of sex are considered morally acceptable as opposed to what circumstances might pose a threat to one's physical, social and emotional health. Although being in a steady relationship has been found to be associated with more positive experiences of first sex, Skinner et al's (2008) qualitative study of Australian women found that a steady relationship was by no means an essential criterion for a positive first sex. For those respondents who were in a stable relationship, there was discussion about waiting until feeling ready; "I waited with my boyfriend for ages just until I felt ready, until I trusted him and that took a long time" (p. 596). However, feelings of readiness were not limited to just those participants in a relationship at the time of first sex; for others, the state of readiness was more likely personal or developmental, rather than an indication of the quality of the romantic relationship. One respondent whose sexual debut was a casual encounter said; "there was no reason behind why I did it. I didn't feel pressured at all, I didn't want it to stop. I suppose you could say I was ready for it" (p. 597). For several girls in the study, their feeling of curiosity regarding sex prompted them to have sex with a friend as they were considered to be 'safe', "I just asked my friend if he would have sex with me because I said I just wanted to experience sex....so one night we just got together and had sex" (p. 596). Often there is a moralised view that sex, and particular first sex, should take place in a stable loving relationship, however, this extract suggests that such a situation is not a necessity for a positive first sexual encounter and that the notion of readiness can also be relevant for those young people who despite not being in a relationship, feel ready to transition to sexual activity.

Using data from the Avon Longitudinal Study of Parents and Children (ALSPAC), Heron et al. (2013) assembled a measure that they termed 'sexual readiness' – based on the 'sexual competence' measure constructed by Wellings et al (2001) - though formed from slightly

different questions (detailed in Figure 2), which asked about the last occurrence of sexual intercourse, as opposed to specifically the *first time* sexual intercourse occurred. The differences in the questions used to construct the ALSPAC measure of sexual readiness limit its comparability with the Natsal sexual competence measure – particularly with regards to the components of ‘willingness’ and ‘timing’.

As shown in Figure 2, the ALSPAC questions tapping into the component of ‘willingness’ are not so concerned with the *relative* willingness of the two partners, but whether the respondent as an individual ‘want[ed] to do it’. The additional question asking “did they make you do it?” probably taps into a more extreme end of the sexual coercion continuum, compared with the equivalent Natsal question. In terms of the question relating to ‘timing’, the ALSPAC version asks explicitly about regret, in an arguably rather leading fashion – starting the question with ‘how much’ presumes a level of regret was experienced.

In line with the Natsal measure, the ALSPAC respondents must endorse each of the criteria positively in order to be deemed ‘sexually ready’. 63% of men and 60% of women who had been sexually active by the time of the 15 ½ year clinic (at which the sexual behaviour questions were asked) were classified as ‘ready for sex’. Heron et al. (2013) conducted univariate regressions to identify whether social background factors were associated with sexual readiness at most recent sexual intercourse. The factors explored were: gender of study child, ethnicity of main carer, maternal age at delivery, partner status of carer, home ownership status of carer, birth order of child, maternal education, income, and social class. The results indicated that none of these variables were statistically significantly associated with the measure of sexual readiness. It is of course possible that there are simply other unmeasured factors, perhaps those more proximate to sexual learning and first sex, that are associated with this measure of ‘sexual readiness’. However, the finding that the ALSPAC measure does not distinguish between individuals of differing social characteristics may indicate that this form of the measure is limited in the extent to which it is valid or meaningful.

Figure 2: Components of sexual competence in Natsal-3 and sexual readiness in ALSPAC

Concept	Natsal-3 Questions	ALSPAC Questions
Willingness of partners	<p>Q: Would you say you were both equally willing to have intercourse that first time, or was one of you more willing than the other?</p> <p>A:</p> <ol style="list-style-type: none"> Both equally willing Respondent more willing Partner more willing 	<p>Q: Did you want to do it?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No <p>Q: Did they make you do it?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No
Timing	<p>Q: Looking back now to the first time you had sexual intercourse, do you think....</p> <p>A:</p> <ol style="list-style-type: none"> You should have waited longer before having sex with anyone That you shouldn't have waited so long It was at about the right time 	<p>Q: How much do you regret having sex intercourse?</p> <p>A:</p> <ol style="list-style-type: none"> Not at all A bit Quite a lot Very much
Autonomous reason	<p>Q: Which one of these applied to you at the time.... (choose the main one that applied at the time)</p> <p>A:</p> <ol style="list-style-type: none"> I was curious about what it would be like I was carried away by my feelings Most people in my age group seemed to be doing it It seemed like a natural 'follow on' in the relationship I was a bit drunk at the time I had smoked some cannabis I had take some other drugs I wanted to lose my virginity I was in love Can't choose/more than one main factor 	<p>Q: Why did you have sexual intercourse?</p> <p>A:</p> <ol style="list-style-type: none"> We were going out together and it seemed natural I wanted to know what it was like I love this person My friends do it So they wouldn't dump me I got carried away I want to lose my virginity <p>Q: The last time you did this, had you been drinking alcohol before it happened?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No <p>Q: After drinking alcohol were you....</p> <p>A:</p> <ol style="list-style-type: none"> Not tipsy at all A bit tipsy Quite tipsy Very tipsy Drunk <p>Q: The last time you did this, had you been using drugs before it happened?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No
Use of reliable method of contraception	<p>Q: Thinking of that first time you had sexual intercourse, did you or your partner use any form of contraception or take any precautions that first time, or not?</p> <p>A:</p> <ol style="list-style-type: none"> Condom The pill Emergency contraception Other contraception (Partner) withdrew Made sure it was a safe period No precautions by me, don't know about partner No precautions by either of us 	<p>Q: Did you use a condom?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No <p>Q: Did you use any other type of contraceptive?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No <p>Q: What other type of contraceptive did you use?</p> <p>A:</p> <ol style="list-style-type: none"> Withdrawal The pill The morning-after pill Something else

The research base concerned with 'sexual competence' or 'readiness' is limited in size and scope. Analyses of Natsal data have included the measure of sexual competence at first sex as one of many variables under examination, but no dedicated assessment of the measure's properties and associated factors has been conducted. Despite the lack of empirical examination into the sexual competence measure, it has nevertheless informed the construction of equivalent or similar variables which have been used in other studies (Heron et al., 2013, Testa et al., 2006), the content of British advisory materials aimed at young people considering their transition into sexual activity (NHS website, 2009), and is included in the WHO list of recommended indicators for monitoring progress towards the Millennium Development Goal of universal access to sexual and reproductive health (WHO and UNFPA, 2010).

2.9 Summary of Chapter 2

- **Much public health research is concerned with the timing of first sexual intercourse as defined by chronological age – with particular emphasis on that which occurs before the age of consent – an arbitrary threshold which has not been changed in over a century in Britain.**
- **A competence-based approach may be a more appropriate means by which to judge the timing and nature of first sexual intercourse, and is consistent with the emerging literature concerned with the context and experience of young persons' sexual encounters as opposed to simply age at occurrence.**
- **Wellings et al., (2001) developed a measure of sexual competence at sexual debut which has informed the majority of subsequent attempts to operationalise sexual competence, as well as advisory material targeted at young people.**
- **No dedicated empirical assessment of the measure of sexual competence has as yet been conducted.**

3. Chapter 3: Overview of Methodology

3.1 The style of this thesis

The London School of Hygiene and Tropical Medicine allow two main styles of thesis: the ‘book’ style and a style that can incorporate ‘research papers’. LSHTM states that these styles are not entirely distinct but form a continuum. For the purpose of this thesis, the quantitative analyses were written up into extended paper-style reports, whereby although their structure is reminiscent of a research paper, their length allows for a depth of detail which can be absent when abiding by scientific journals’ maximum word counts. Inherent in this style of thesis is some repetition in the ‘introduction’ and ‘methods’ sections of certain chapters.

Specific details of the methodology employed in this thesis are provided in each results chapter, therefore the current chapter provides an overview of the data sources used in this thesis, and introduces concepts from the field of psychometrics which are drawn upon in throughout the thesis.

3.2 Data Sources

This PhD primarily analyses data from the Third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). Supplementary analyses were also conducted using data from the Avon Longitudinal Study of Parents and Children (ALSPAC) and the Dunedin Multidisciplinary Health and Development Study (DMHDS), in order to answer certain research questions involving factors that were not measured in Natsal-3.

3.2.1 The Third National Survey of Sexual Attitudes and Lifestyles (Natsal-3)

For a detailed description of Natsal-3 methodology, see the technical report by Erens et al. (2013).

To date, three Natsal surveys have been carried out in Britain; Natsal-1 in 1990-1991, Natsal-2 in 1999-2001, and Natsal-3 in 2010-2012. These surveys are have been conducted by a multi-disciplinary teams of researchers from the London School of Hygiene and Tropical Medicine (LSHTM), University College London (UCL), and NatCen Social Research (NatCen), and are among the largest and most detailed studies of sexual behaviour and health in the world.

Participants

Natsal-3 aimed to interview a representative sample of men and women aged 16-74 living in private households in Great Britain. A multi-stage, clustered and stratified probability design was

employed, with postcode sectors selected as the primary sample units, addresses within them selected at the second stage, and one eligible adult was randomly selected at the final stage. The target sample size was 15,000 – made up of a ‘core’ of 10,000 adults aged 16-74, and a further ‘boost’ sample of 5,000 younger adults ages 16-34. Interviews were completed with 15,162 respondents, resulting in an overall response rate of 57.7%. The response rate was lowest in the ‘core’ addresses (54.5%) and higher in both sample ‘boosts’: 64.8% in boost 1 of 16-34 year olds and 67.3% in boost 2 of 16-29 year olds. The proportion of all cases interviewed of all eligible units ever contacted, known as the ‘cooperation rate’, was 65.8%.

Data collection

The interview began with face-to-face computer-assisted interviewing (CAPI), followed by a computer assisted self-completion component (CASI), and ended with further face-to-face computer-assisted interviewing (CAPI). The questionnaire was made up of five sections:

- 1) Health, family, and learning about sex
- 2) First sexual experiences, use of contraception and sexual lifestyle
- 3) The self-completion section which covered the topics deemed most sensitive, such as questions relating to number of sexual partners, sexual practices, sexual health
- 4) Attitudes and risks
- 5) Socio-demographic questions

The more sensitive questions which were asked in the face-to-face components made use of show cards, meaning respondents could simply verbalise a number to indicate their choice of response. This helped preserve confidentiality in case of being overheard by other household members. Although the questions relating to first sexual intercourse (including those used to construct the measure of ‘sexual competence’) were generally asked in the face-to-face component, where interviewers felt that respondents might be inhibited from answering the questions, they could choose to defer completing this section to the beginning of the self-completion questionnaire to be answered by the participant more privately (this section was deferred in 11.7% of interviews).

Where respondents reported that they first had sexual intercourse at 12 years old or younger, the questions related to the circumstances and experience of first sex (used to construct the sexual competence measure) were asked about their first sexual intercourse since turning age 13. This was with the aim of avoiding probing questions about early sexual encounters which may have been non-consensual. 1.4% (n=46) of the sexually active 16-24 year old sample used in this thesis reported first intercourse at age 12 or younger – and so these respondents will

have answered the sexual competence questions relating to their first intercourse since turning 13.

Urine samples were collected to test for Chlamydia trachomatis, Neisseria gonorrhoeae, Human Immunodeficiency Virus (HIV) antibody, type-specific Human Papillomavirus (HPV), and Mycoplasma genitalium. Men and women aged 16-44 who reported at least one lifetime sexual partner were eligible for providing a urine sample. Specimens were requested from all eligible 16-24 year olds, all men aged 25-44 who reported a same-sex partner in the last 5 years, and a randomly selected 85% of eligible respondents aged 25-44. Of the eligible respondents, 60% provided a urine sample.

Sample weighting

In order to use the sample as a representative sample of the general population of Britain, weights were applied to the sample based on the unequal probability of selection and non-response. After the application of weights, the Natsal-3 sample matched the 2011 census data for Britain on age, sex and region. A close match was also observed on marital status, ethnic groups and self-reported general health.

3.2.2 Avon Longitudinal Study of Parents and Children (ALSPAC)

For full details of the ALSPAC study see <http://www.bristol.ac.uk/alspac/researchers/> (ALSPAC, 2008)

The Avon Longitudinal Study of Parents and Children (ALSPAC) recruited 14,541 pregnant women resident in Avon, UK with estimated dates of delivery between April 1991 and December 1992. These women, the children arising from the index pregnancy and the women's partners have been followed-up since then and detailed data collected throughout childhood. When compared with the 1991 National Census Data, the ALSPAC sample was broadly similar to the whole population of the UK. The main differences are that the ALSPAC sample has a slightly higher proportion of married or cohabiting mothers, and a slightly smaller proportion of women from ethnic minorities (ALSPAC, 2008)

Data have been collected through the use of survey-style questionnaires, and for certain topics, sub-samples (children from approximately 7000 families) of the cohort attended 'clinics' in which face-to-face interviews were carried out. It was in these clinics, when the children were aged 15.5 years, that data on sexual experiences was collected using computer-assisted interviews, following a protocol based on the Adolescent Sexual Activity Index (Hansen et al., 1999). The same conceptual components of sexual competence are measured in ALSPAC as are

in Natsal (contraceptive use, autonomous reason, willingness, and timing) though the questions are worded in different ways and/or have different answer categories (detailed in Figure 2, Chapter 2). Unlike Natsal-3, ASLPAC also included a question asking whether enjoyment was derived from the sexual encounter. Therefore this data set allowed an exploration of how enjoyment related to the components making up the sexual competence measure (Chapter 6, Section 3).

3.2.3 Dunedin Multidisciplinary Health and Development Study (DMHDS)

For a detailed description of the Dunedin Multidisciplinary Health and Development Study (DMHDS) see Silva (1990).

The DMHDS is a longitudinal study of a cohort born between April 1st, 1972, and March 31st, 1973 in the city of Dunedin, New Zealand's South Island. 91% of the eligible births participated in the 3 year old assessment, providing a base sample of 1037 (52% male, 48% female). The children's fathers were representative of the social class distributions in the general population of New Zealand's South Island, and with only 7% identifying themselves as Maori or Polynesian, the sample also matched the ethnic make-up of the South Island.

At the age 21 assessment, data about health-behaviours, including first sexual intercourse, were collected from 961 participants (92.7% retention). The sexual behaviour questions were presented via a computer with an interviewer in the room for assistance, but who could not see the responses entered by the participant. The four questions relating to the experience of first sex that are used to derive the measure of 'sexual competence' in Natsal were asked at age 21 in the DMHDS. Additional to the Natsal-3 questions, DMHDS included questions relating to the continuation of the romantic relationship after first intercourse, and the degree of planning of first intercourse, enabling an assessment of how these two variables related to sexual competence at first intercourse (Chapter 7, Section 2).

3.2.4 Qualitative data

Qualitative data was collected by Melissa Palmer through face-to-face in-depth cognitive style interviews with a sub-sample of Natsal-3 respondents.

Rationale

A small exploratory qualitative component was conducted as part of this PhD for two main reasons: 1) in order to gain an insight into how Natsal-3 participants went about answering the questions that make up the 'sexual competence measure' and 2) so that I, as a researcher, could gain experience in conducting and analysing qualitative interviews.

The survey questions which are used to compile the measure of sexual competence span concepts of willingness, autonomy of decision, evaluation of timing, and contraceptive use and, as is necessary for survey questions, are closed-end and relatively crude. Therefore, this qualitative follow-up study focused on how Natsal respondents interpreted these questions and reflected on their own experiences to formulate their given answers (Chapter 9).

Recruitment

During the Natsal-3 interview, respondents were asked whether they would be willing for a researcher to contact them again about taking part in a further interview. This question was worded as follows:

'It is possible that we may want to contact you again to obtain further information about some of the topics covered in this study. Would you be willing for a researcher from the study to contact you again about taking part in another interview?'

Those who responded yes to this question comprised the potential sample from which participants for my qualitative work were drawn.

The sample was selected purposively to include respondents who gave a range of different answers to the four survey questions under study. Originally it was planned that after conducting 12 interviews, two more respondents would be selected according to any suspected data gaps, bringing the total number of interviewees to 14, however due to time and monetary constraints, interviewing stopped after the initial 11 respondents.

Conduct of the interviews

All interviews were carried out in the interviewees' home at a time convenient to them. The interview essentially entailed two components; firstly respondents were asked to give as full account as possible of the first time they had sex; and secondly they were presented with the four Natsal questions regarding the circumstances of their first sex, and cognitive interviewing style probes were used to gain insight into how and why participants gave the answer that they did. The topic guide can be found in Appendix 1, and full protocol in Appendix 2. All interviews were audio-recorded and no participants declined recording.

Ethics approval

Ethics approval was gained from the LSHTM Ethics Committee and the National Research Ethics Service (NRES) South Central – Oxford A. Copies of the letters of approval are presented in Appendix 3.

3.3 Reliability and Validity

Psychometric methods are a set of specialised procedures for ensuring validity and reliability in the development of measurement instruments. This thesis does not aim to develop a measure of sexual competence, but is concerned with providing a comprehensive assessment of the existing measure's potential utility in public health research and efforts. Therefore, while this PhD does not claim to be based in the field of psychometrics, certain methods and concepts are drawn upon where relevant to overarching purpose of the thesis.

Two main concepts are fundamental within psychometrics: reliability and validity. Reliability refers to the extent to which a measure is free of error, while validity is concerned whether the scale (or measure) measures the intended construct adequately (DeVellis, 2003). There are multiple ways in which validity and reliability are conceptualised and operationalised, which determine the way in which they are empirically assessed. In this section I provide an overview of aspects of validity and reliability, how they are empirically assessed, and their relevance for the content of this PhD.

3.3.1 Validity

Face validity

Face validity simply refers to whether the instrument appears to be measuring what it is supposed to measure and is reliant on a subjective assessment of the relevance of the items included in the measure. Though psychometricians argue that face validity is an inadequate assessment of the validity of a measure, there is general agreement in terms of its importance in public relations, so that the instrument appears relevant to those completing it, as well as those making decisions about whether to use it (Guilford, 1954; Nunnally, 1970; Kline, 1986).

Content validity

Content validity is concerned with whether an instrument taps in to all the relevant components of the construct it intends to measure i.e. the extent to which a specific set of items reflects a content domain (DeVellis, 2003; Nunnally, 1970). Content validity is easiest to measure when the domain is well defined, for example, all the vocabulary words taught to 8 year olds. However, the issue is more subtle and more complex when measuring social constructs (DeVellis, 2003).

The face validity and content validity of the measure of sexual competence are discussed in Chapter 4, with reference definitions of sexual health, and the content of British governmental advisory materials.

Criterion-related validity

Criterion-related validity refers to whether the measure demonstrates an empirical association with some theoretically related criterion or 'gold standard'. Criterion-related validity is sometimes referred to as 'predictive validity', when the particular criterion follows the measure temporally, 'concurrent validity' when the criterion is another psychometric measure of the same construct used in parallel with the measurement in question, and 'post-predictive' validity when the criterion temporally precedes the measure. However, the time relationship between the instrument and the criterion whose value one is attempting to 'predict' is not a particularly important aspect of criterion-related validity, it is the nature and strength of the empirical relationships that is of greatest relevance for assessing this type of validity (DeVellis, 2003).

Given that the measure of sexual competence is the first of its kind, there exist no 'gold-standard' measures with which to test it against. Chapters 7 and 8 explore the antecedent and subsequent factors associated with the measure of sexual competence – including criteria one might expect to be associated with sexual competence at first sex, such as age at sexual debut – therefore the results presented in these chapters are of relevance to assessing the criterion-related validity of the measure.

Construct validity

Construct validity was introduced by Cronbach and Meehl (1955) who argued that instruments claiming to measure abstract constructs, as opposed to concrete observable variables, required a further form of validation. Factor analysis can be used to evaluate construct validity; by assessing the correlations between the items making up the instrument, this statistical method can provide information on whether the underlying structure of the 'latent' factor is similar to the one hypothesised, for example, whether the scale measures a single or multiple underlying construct(s).

The construct validity of the sexual competence measure is considered in Chapter 6 using confirmatory factor analysis to assess whether the four items making up the measure seem to be tapping into a single underlying construct, as hypothesised.

3.3.2 Reliability

Internal consistency

'Internal consistency' reliability refers to the homogeneity of the items within a scale, i.e. the extent to which the items correlate with one another and therefore, are measuring the same underlying construct (DeVellis, 2003). Internal consistency is commonly equated with

Cronbach's alpha (Cronbach, 1951), which provides a value between 0 and 1 to indicate the proportion of the variation in the measure that is due to true variation in the underlying construct that one is aiming to measure – the remaining variation is hypothesised to be due to error.

Measures made up of a greater number of items are more likely to demonstrate greater reliability – and therefore, adding more homogenous items to the scales can result in higher reliability coefficients. There is no hard and fast rule governing the minimum number of items required for a reliable scale, however researchers have suggested that 20 items are usually sufficient, though more may be required when the items are dichotomous (Nunnally, Kline, 1986).

The internal consistency of the sexual competence measure is discussed in Chapter 6.

Test re-test reliability

Test re-test reliability is a measure of stability over time, and can be assessed by repeat administration of the scale to the same group of respondents and correlating the scores from the two occasions. This is based on the rationale that if a measure truly reflects some meaningful construct, it should assess that construct comparably on separate occasions (DeVellis, 2003).

Test re-test reliability of the sexual competence measure could not be examined as Natsal is a cross-sectional study, and so the questions making up the measure were only asked once. It would not necessarily be expected that the measure would exhibit high test re-test reliability given its highly interpretive questions - answers to which are likely to be influenced not only by the reality of the first sexual intercourse, but also events that occurred in life subsequently.

3.3.3 The relationship between reliability and validity

It has been argued that in order to be valid, a measure must also be reliable, "high reliability is a necessary but not sufficient condition for high validity" (Nunnally, 1970) (p.107). However, this view is not held by all psychometricians – others have argued that high reliability in the form of internal consistency can actually be a challenge to validity, in that high internal consistency is often achieved at the expense of content and/or construct validity. In selecting a set of items due to their high degree of internal consistency, there is a risk that these items will not tap into all dimensions of the construct, resulting in an instrument that is an inadequate measure of the construct it aims to assess (Cronbach and Meehl, 1955; Kline, 1986). Streiner and Norman argue that it is better to sacrifice internal consistency for content validity, rather than the other way

around, as “the ultimate aim of the scale is inferential, which depends more on content validity than internal consistency” (Streiner and Norman, 1995) (p.147).

3.4 Summary of Chapter 3

- **The structure of this thesis lies on the continuum between a ‘book’ style and ‘research paper’ style PhD. Therefore, details of methodology are included within each chapter and there is an inevitable degree of repetitiveness in the introductory sections of several chapters.**
- **The third National Survey of Sexual Attitudes and Lifestyles (Natsal-3) is the main data source used in this thesis. Data from two supplementary sources (ALSPAC and DMHDS) were analysed in order to answer specific research questions relating to factors for which data was not collected in Natsal-3.**
- **Qualitative data was collected in order to explore how respondents understood, and formulated their answers to, the Natsal questions used to construct the sexual competence measure.**
- **Certain methods and concepts from the field of psychometrics are drawn upon where relevant to overarching research question.**

4. Chapter 4: The Natsal-3 measure of 'sexual competence'

This chapter presents the content and construction of the Natsal measure of 'sexual competence' at first heterosexual intercourse. Drawing upon definitions of sexual health, and British policy and practice literature, this chapter discusses the extent to which the content of the sexual competence measure is compatible with ideas regarding healthy and optimal sexual behaviour.

4.1 The construction of the measure of 'sexual competence' at first intercourse

Figure 3: Natsal-3 questions used to construct 'sexual competence' at sexual debut measure. Highlighted are the answers that must be given for a respondent to be classified as sexually competent at sexual debut.

Concept	NATSAL-3 Questions	Coding
Willingness of partners	Q: Would you say you were both equally willing to have intercourse that first time, or was one of you more willing than the other? A: 1. Both equally willing 2. Respondent more willing 3. Partner more willing	Equally willing = 1 if answer = 1 Equally willing = 0 if answer = 2 or 3
Acceptable timing	Q: Looking back now to the first time you had sexual intercourse, do you think... A: 1. You should have waited longer before having sex with anyone 2. That you shouldn't have waited so long 3. It was at about the right time	Right time = 1 if answer = 3 Right time = 0 if answer = 1 or 2
Autonomy of decision	Q: Which one of these applied to you at the time.... (choose the main one that applied at the time) A: 1. I was curious about what it would be like 2. I was carried away by my feelings 3. Most people in my age group seemed to be doing it 4. It seemed like a natural 'follow on' in the relationship 5. I was a bit drunk at the time 6. I had smoked some cannabis 7. I had taken some other drugs 8. I wanted to lose my virginity 9. I was in love 10. Can't choose/more than one main factor	Autonomous reason = 1 if answer = 1 or 2 or 3 or 4 or 8 or 9 Autonomous reason = 0 if answer = 3 or 5 or 6 or 7
Use of reliable method of contraception	Q: Thinking of that first time you had sexual intercourse, did you or your partner use any form of contraception or take any precautions that first time, or not? A: 1. Condom 2. The pill 3. Emergency contraception 4. Other contraception 5. (Partner) withdrew 6. Made sure it was a safe period 7. No precautions by me, don't know about partner 8. No precautions by either of us	Reliable contraceptive protection = 1 if answer = 1 or 2 Reliable contraceptive protection = 0 if answer = 3 or 4 or 5 or 6 or 7 or 8

Figure 3 presents the survey questions used to construct the Natsal measure of sexual competence. In order to be categorised as 'sexually competent' at first intercourse, a respondent must report the following four conditions:

- (1) Both partners 'equally willing'
- (2) Acceptable timing (that it happened at the 'right time')
- (3) Autonomy of decision (not due to peer pressure, alcohol, or drugs)
- (4) Use of reliable contraception (condom or pill)

As is typical of survey questions, those used to construct the measure of sexual competence are relatively simplistic. Moreover, while each of these questions will be answered retrospectively, some may be more prone to dependency on what happened subsequently to the first intercourse than others. For example, while the type of contraceptive method is used cannot be affected by the passage of time, it seems reasonable that the other more psycho-social questions would be, particularly that relating to the acceptability of the timing of first intercourse. The way in which respondents understand and formulate their answers to these four questions is explored using qualitative data from cognitive-style interviews in Chapter 9.

It should be noted that during the Natsal-3 interview, respondents could specify 'other' contraception as their answer, but no more information was provided on what this contraception type was. This means that they could have conceivably used a reliable method of Long Acting Reversible Contraception (LARC) e.g. contraceptive implant, intra-uterine device, but will have been coded as having used a non-reliable contraception. As shown in Figure 11 (Chapter 5), this risk of misclassification will have only been relevant for very few respondents; just 17 respondents reported having used only an 'other' contraceptive method.

4.2 Focus on intercourse, as opposed to non-coital activities

The questions making up the Natsal measure of sexual competence are asked specifically about *first heterosexual intercourse*. This focus on penetrative penile-vaginal intercourse is common to most studies concerned with sexual behaviour, however, it does neglect that fact that people engage in an array of sexual activities. Young people often experience non-coital activities before having sexual intercourse for the first time (Schwartz, 1999; Halpern-Felsher et al., 2005; O'Sullivan and Brooks-Gunn, 2005). It has been suggested that young people engage in such non-coital activities as a substitute for penetrative sex in order to maintain their virginity (Bersamin et al., 2007) and because of their perceived reduced risk of negative sexual health outcomes (Halpern-Felsher et al., 2005). A qualitative study of British adolescents identified a

normative sequence in which young people expected to engage in certain activities – (vaginal) fingering, ‘hand jobs’, ‘blow jobs’, ‘licking out’ and finally, ‘sex’ – vaginal intercourse (Lewis et al., 2013). The young participants described why they expected to engage in non-coital practices before ‘losing their virginity’ with reference to ideas that non-coital practices can “help develop and demonstrate sexual skill, prepare girl for vaginal intercourse’, enable learning about partnered sexual pleasure and are part of developing intimacy in a relationship” (p. 5).

However, penetrative intercourse is commonly regarded as what constitutes ‘proper sex’ – during which manhood is ‘achieved’ and virginity ‘lost’ (Holland et al., 2000; Bersamin et al., 2007), with the pre-coital activities considered to be ‘building-up to’ intercourse (Lewis et al., 2013), and so, it is also possible that it is specifically first intercourse that is the most salient ‘first’ in young people’s sexual trajectories.

4.3 Definitions of sexual health

The original construction of the measure of sexual competence was based on possibly the most frequently cited definition of sexual health - that endorsed by the World Health Organisation (WHO, 2006):

“Sexual health is a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled.”

The measure of sexual competence is consistent with the broader, more holistic definition of sexual health endorsed by the WHO, emphasising not only physical health, but also emotional and social well-being in the form of willingness, autonomy and feelings about timing.

The WHO definition also refers to “the possibility of having a pleasurable...sexual experience”. No measure of pleasure is included in Wellings’ operationalisation of competence. Pleasure is a complex concept to describe, let alone measure; it may be derived from physical stimulation or the emotional reaction to engaging in certain behaviours. Particularly at the beginning of sexual careers, both in life and within new sexual relationships, a sexual encounter may be emotionally desired, yet not strictly physically pleasurable, but still judged as a positive experience overall (Hirst, 2008). Since the WHO states “the *possibility* of pleasure”, one could argue that being sexually competent is likely to increase the probability of gaining pleasure from the sexual experience; a sexual encounter that is wanted and protected is likely to be a more emotionally pleasurable experience.

A review examining the way in which sexual health is defined (Edwards and Coleman, 2004), identified eight major definitions of sexual health. Similar to the WHO definition of sexual health, the additional seven definitions also move beyond the absence of disease and defined sexual health within a social framework. Highlighted in these definitions is the importance of physical, social and emotional aspects of sexual health: which include the ability to avoid STIs and unintended pregnancy, to be free of coercion, the responsible expression of sexual capabilities, and the maintenance of sexual rights.

4.4 Is a holistic approach to sexual health compatible with UK governmental documentation?

The more holistic approach to sexual health embodied by the measure of sexual competence is also consistent with the views presented in British governmental documents concerned with improving sexual and reproductive health. Though there is a tendency to measure country-level progress in improving sexual health in terms of the biomedical, such as STIs rates and under-18 conceptions, governmental documentation does seem to recognise a broader definition of sexual health.

4.4.1 *The National Strategy for Sexual Health and HIV*

The National Strategy for Sexual health and HIV was published in 2001 in order to address the rising prevalence of STIs and HIV in Britain and claims to endorse a holistic model of sexual health, with explicit reference to 'equitable relationships' and 'sexual fulfilment':

"Sexual health is an important part of physical and mental health. It is a key part of our identity as human beings together with the fundamental human rights to privacy, a family life and living free from discrimination. Essential elements of good sexual health are equitable relationships and sexual fulfilment with access to information and services to avoid the risk of unintended pregnancy, illness or disease" (Department of Health, 2001) (p. 5).

4.4.2 *Teenage Pregnancy Strategy*

The Teenage Pregnancy Strategy was developed in 1998 with the aim to halve the under-18 conception rate by 2010 (Social Exclusion Unit, 1999). The *Teenage Pregnancy Strategy: Beyond 2010* report (Department for Schools Children and Families and Department of Health, 2010) refers not only to the importance of enabling young people to use contraception effectively in order to avoid unintended pregnancies and STIs, but also to the:

"skills and confidence that helps to ensure that they are not pressurised into making choices that put their health, safety or emotional well-being at risk by having sex before they are ready." (p. 20)

The document makes multiple references to resisting pressure to have sex until 'ready' - this use of language is significant. The concept of readiness is consistent with sexual competence; that

an adolescent can be ready or not for sex takes account of the individual differences that exist between young people, rather than judging the acceptability of sexual activity solely on the grounds of chronological age.

The Teenage Pregnancy Strategy launched a media campaign: *Sex. Worth Talking About*. The campaign's website provides information for young people and one of its sections, *Teen Talk*, links to a NHS web page entitled *Are you ready for sex?* which lists 10 questions to be considered by a young person who is considering transitioning into sexual activity (Figure 4). This resource was actually developed based on the Natsal sexual competence measure, indicating an acceptance of this concept by state organisations.

Figure 4: Are you ready for sex? (NHS website, 2009)

If you think you might have sex, ask yourself the following questions to help you make up your mind:

- *Does it feel right?*
- *Do I love my partner?*
- *Does he/she love me just as much?*
- *Have we talked about using condoms, and was the talk OK?*
- *Have we got contraception organised to protect against pregnancy?*
- *Do I feel able to say 'no' at any point if I change my mind, and will we both be OK with that?*

If you answer yes to all these questions, the time may be right. But if you answer yes to any of the questions below, it might not be:

- *Do I feel under pressure from anyone, such as my partner or friends?*
- *Could I have any regrets afterwards?*
- *Am I thinking about having sex just to impress my friends or keep up with them?*
- *Am I thinking about having sex in order to keep my partner?*

It's hard to stay in control if you're drunk. You should never feel under any pressure to have sex, whether it's from your partner or your friends. It's a big decision and you need to feel ready.

(NHS website, 2009)

4.4.3 Sex and Relationship Education Guidance

Sex and Relationship Education (SRE) guidance recognises the need for the development of skills to resist pressures to have sex, rather than just the provision of knowledge relating to STIs and pregnancy.

"Effective sex and relationship education does not encourage early sexual experimentation. It should teach young people to understand human sexuality and to respect themselves and others. It enables young people to mature, to build up their confidence and self-esteem and understand the reasons for delaying sexual activity. It builds up knowledge and skills which are particularly important today because of the

many different and conflicting pressures on young people.” (Department for Education and Employment, 2000) (p. 4)

“Young people need skills to enable them to avoid being pressured into unwanted or unprotected sex (this should link with issues of peer pressure and other risk-taking behaviour such as drugs and alcohol).” (Department for Education and Employment, 2000) (p. 17)

The content of the Sexual and Relationship Education guidance corresponds particularly closely with notion of sexual competence to be explored in this PhD. This is relatively unsurprising as the competence-based approach to sexual health and behaviour among young people is about the positive development of responsible and safe sexual lifestyles from when one first embarks on sexual activity, which mirrors the overall aim of sex and relationship education in schools. The SRE guidance explicitly states the need for the development of skills relevant to overall sexual wellbeing (and, implicitly, sexual competence). This shows the policy makers’ recognition of the need for a more comprehensive approach to young people’s sexual health, which expands far beyond the reductionist vision of sexual health to incorporate the social and emotional aspects vital for healthy sexual development.

4.5 Implications for face validity and content validity

As described in Chapter 3, face validity refers to whether the instrument appears to be measuring what it is supposed to measure, while content validity is concerned with whether the instrument taps into all the relevant components of the construct.

Sexual competence does not have any established definition – the development of the measure in effect occurred in reverse; rather than inductively developing a conceptual framework and forming a measure based on that, researchers chose four variables they deemed to be indicate what was termed ‘sexual competence’. Since this operationalisation, any discussions of sexual competence in the literature seem to draw upon these four variables in defining the concept. Therefore, one could argue that this instrument is the perfect measure of sexual competence since it has provided the definition that a ‘sexually competent’ first intercourse is one characterised by equal willingness, autonomy of decision, acceptable timing, and contraceptive protection.

However, more broadly, the measure was intended to provide an alternative assessment of the nature of first sex, one based not on chronological age, but on the protection of sexual health in the broader sense. That is, alongside protection against unintended conception and/or STIs, the social and emotional aspects of sexual health were to be included, for example, lack of coercion. The WHO definition also refers to “the possibility of having a pleasurable...sexual experience”. The absence of an indicator of pleasure in the existing measure of sexual competence may

represent the greatest challenge to the instrument's content validity. The role of enjoyment in the construct of sexual competence is explored using ALSPAC data in Chapter 6, Section 3, and qualitative data in Chapter 9.

4.6 Summary of Chapter 4

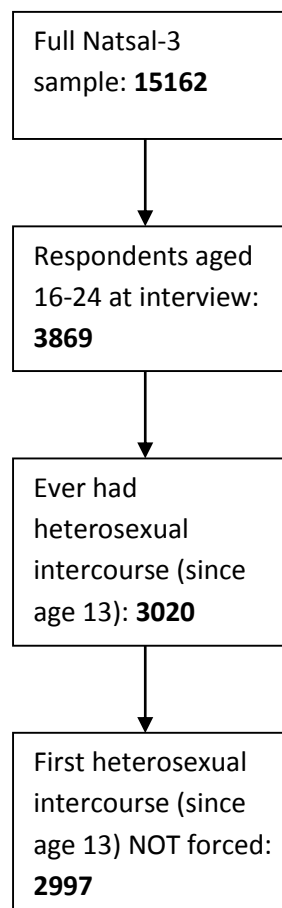
- **The Natsal-3 measure of sexual competence is constructed from four questions relating to relative willingness of partners, autonomy of decision, acceptability of timing, and contraceptive protection. These questions were only asked about first heterosexual intercourse.**
- **The measure was constructed with reference to a more holistic definition of sexual health, as endorsed by the WHO.**
- **The inclusion of broader psycho-social dimensions of sexual health in the measure is compatible with the UK sexual health governmental literature.**
- **The possibility of sexual 'pleasure' or 'enjoyment' is recognised as an aspect of sexual health by the WHO. The lack of an indicator of enjoyment in the current measure of sexual competence may represent a challenge to the content validity of the measure.**

5. Chapter 5: Description of Natsal-3 sample

This chapter presents a description of the sample used throughout this thesis.

Figure 5 visualises the how the sub-sample used was derived from the full Natsal-3 sample. For the purpose of this research, analysis has been restricted to those respondents aged 16-24 years at interview in order that the results are applicable to the contemporary young population of Britain who transitioned into sexual activity around or since turn of the millennium, and therefore will have been subject to similar social and cultural norms surrounding first sex. This age group are also of particular public health relevance as they are more likely to be engaging in transient sexual relationships and are at greatest risk of negative sexual health outcomes, such as STIs (Public Health England, 2012). Those who reported that their first sexual intercourse was 'forced' were dropped from the all analyses because of the focus of the PhD on the measure of 'sexual competence'. A respondent who has been classified as not sexually competent because their first sex was forced is likely to have had a substantially different experience to those who were categorised as not sexually competent due to a less extreme reason. Therefore, it was felt that including those who were forced as not sexually competent was inappropriate, and could have biased results towards greater associations between non-competence and subsequent sexual health indicators.

Figure 5: Derivation of sub-sample from full Natsal-3 survey, conducted in 2010-2012



5.1 Description of 16-24 year old sexually active sample

Table 2 and Table 3 present a description of the sample used in the analyses presented in this thesis (aged 16-24 at interview, who have ever had heterosexual sex, and whose first heterosexual sex was not forced), according to socio-demographic variables, variables relating to learning about sex, and the circumstances of first sex, by gender.

Table 2: Description of sexually active 16-24 year old sample by socio-demographic variables

Descriptive Statistics by gender: Socio-demographics among sexually active					
	Men		Women		
	%	95% CI	%	95% CI	N (unweighted/ weighted)
IMD quintile					
1: Least deprived	17.06	(14.62- 19.81)	16.95	(14.68- 19.48)	505/324.06
2	19.17	(16.71- 21.89)	18.00	(15.72- 20.54)	553/354.46
3	18.36	(16.01- 20.97)	19.86	(17.60- 22.33)	566/363.84
4	23.77	(20.66- 27.17)	22.24	(19.74- 24.97)	649/438.75
5: Most deprived	21.65	(18.93- 24.63)	22.95	(20.38- 25.73)	724/424.58
Parental social class					
No-response	11.11	(9.32- 13.20)	9.69	(8.23- 11.39)	318/192.84
Manual	17.38	(15.16- 19.86)	18.76	(16.72- 20.98)	554/334.13
Non-manual	71.51	(68.50- 74.33)	71.55	(68.99- 73.98)	2019/1323.73
Ethnicity					
White	88.13	(85.71- 90.19)	88.04	(85.78- 89.98)	2683/1677.70
Mixed	3.14	(2.21- 4.43)	3.89	(2.97- 5.07)	110/ 66.70
Asian	4.31	(3.12- 5.92)	2.91	(2.00- 4.22)	85/ 69.08
Black	3.10	(2.15- 4.45)	3.69	(2.55- 5.31)	82/ 64.55
Chinese and other	1.33	(0.74- 2.37)	1.47	(0.87- 2.47)	35/ 26.60
Religion					
None	68.49	(65.52- 71.31)	65.29	(62.54- 67.95)	2037/1273.99
Christian C of E	3.32	(2.37- 4.63)	4.40	(3.40- 5.67)	112/ 73.19
Roman catholic	7.35	(5.90- 9.12)	8.12	(6.76- 9.72)	234/147.05
Christian other	15.13	(13.08- 17.45)	17.97	(15.87- 20.29)	486/314.40
Non-Christian	5.70	(4.30- 7.53)	4.22	(3.15- 5.63)	124/ 94.80
Education					
Left at 16, no qual.	4.59	(3.53- 5.94)	4.46	(3.60- 5.52)	159/ 86.11
Left at 16, with qual.	18.72	(16.51- 21.16)	15.59	(13.82- 17.54)	561/327.12
Left at 17	70.38	(67.45- 73.15)	75.01	(72.65- 77.23)	2077/1381.49
Currently 16	6.31	(5.13- 7.73)	4.93	(3.96- 6.13)	194/107.23
Age					
16-17	14.10	(12.26- 16.16)	13.99	(12.33- 15.83)	496/267.61
18-19	22.00	(19.52- 24.70)	20.13	(18.17- 22.25)	677/401.92
20-21	29.07	(26.25- 32.05)	24.49	(22.20- 26.93)	720/511.32
22-23	24.07	(21.50- 26.84)	26.96	(24.66- 29.40)	735/485.54
24+	10.77	(9.03- 12.79)	14.44	(12.59- 16.50)	369/239.29
Family structure at 14					
Both parents	70.08	(67.42- 72.61)	63.45	(60.96- 65.86)	1874/1273.02
One or no parents	29.92	(27.39- 32.58)	36.55	(34.14- 39.04)	1122/631.42

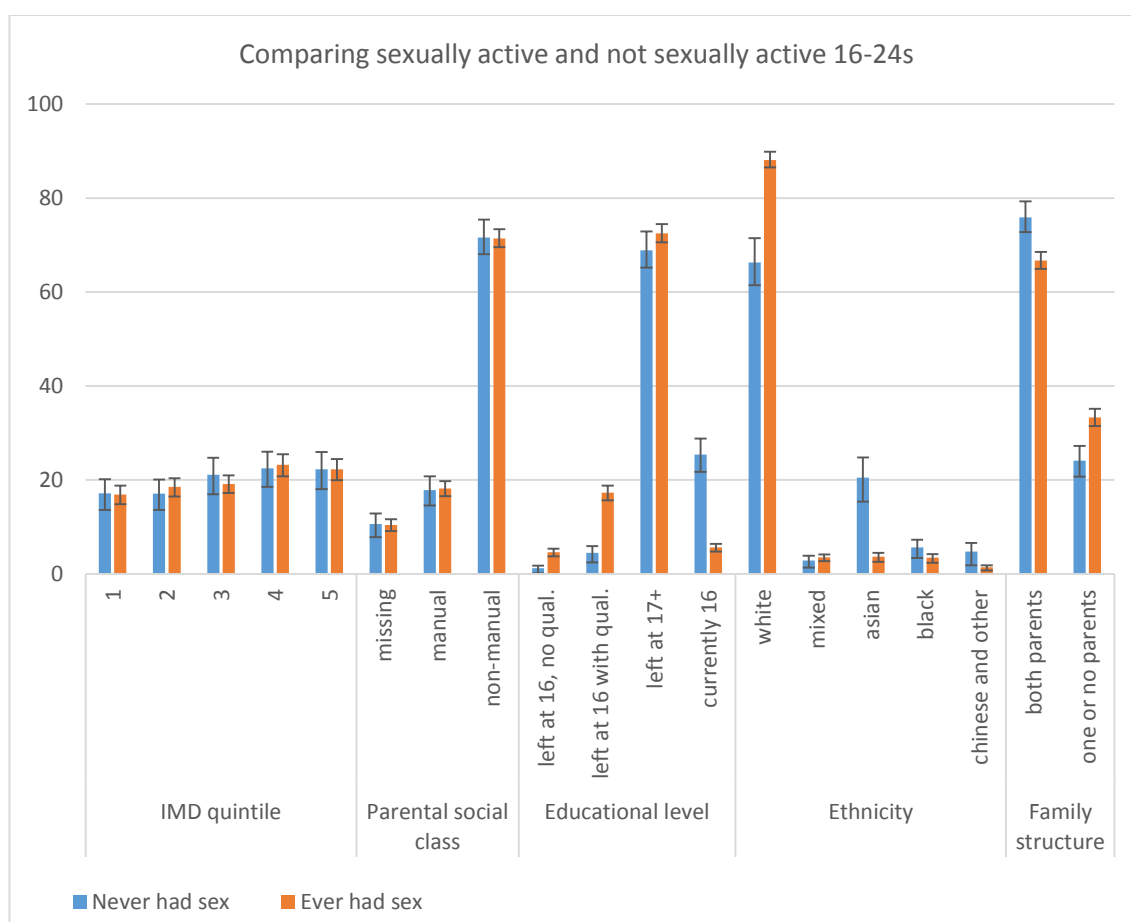
Table 3: Description of sexually active 16-24 year old sample by variables relating to learning about sex and circumstances of first sex

Descriptive Statistics by gender: Learning about sex and circumstances of first sex					
	Men		Women		
	%	95% CI	%	95% CI	N (unweighted/ weighted)
Main source of sex education					
Parents	7.75	(6.19- 9.66)	14.55	(12.83- 16.46)	346/209.97
School	34.82	(31.95- 37.80)	36.77	(34.25- 39.36)	1063/678.44
Friends	25.08	(22.60- 27.73)	26.72	(24.42- 29.16)	793/490.90
Other	32.35	(29.57- 35.26)	21.96	(19.73- 24.37)	781/517.36
Ease discussing sexual matters with parents at 14					
Easy with one/both	27.46	(24.72- 30.39)	32.89	(30.39- 35.49)	884/559.75
Difficult	7.81	(6.27- 9.68)	9.42	(7.86- 11.25)	240/159.76
Didn't discuss	61.87	(58.76- 64.88)	54.07	(51.41- 56.71)	1687/1079.28
Varied by topic	2.86	(1.78- 4.57)	3.62	(2.76- 4.75)	95/ 60.08
Type of relationship with first sexual partner					
Just met	4.71	(3.56- 6.21)	2.90	(2.00- 4.20)	102/ 72.62
Recently met	11.66	(9.91- 13.67)	5.92	(4.75- 7.35)	254/168.15
Known a while, not in relationship	31.34	(28.54- 34.28)	23.38	(21.13- 25.78)	824/520.99
Ex-partner	3.78	(2.79- 5.09)	4.21	(3.21- 5.50)	117/ 75.67
Steady relationship	48.38	(45.33- 51.44)	62.14	(59.49- 64.72)	1666/1045.46
Living together or married	0.14	(0.03- 0.55)	1.45	(0.91- 2.31)	22/ 14.78
Partner's first sex too?					
Yes	49.71	(46.64- 52.79)	37.41	(34.72- 40.18)	1246/802.85
Yes, I think so	5.05	(3.76- 6.76)	2.74	(2.01- 3.74)	100/ 72.00
No, I don't think so	8.22	(6.50- 10.34)	5.48	(4.37- 6.84)	188/126.32
No	37.02	(34.09- 40.05)	54.37	(51.50- 57.20)	1355/837.67
Age at first sex					
13-15	38.78	(35.85- 41.80)	36.41	(33.82- 39.09)	1214/717.05
16-17	42.34	(39.39- 45.34)	46.08	(43.48- 48.71)	1334/841.66
18-19	15.92	(13.80- 18.31)	13.29	(11.44- 15.38)	364/278.97
20+	2.96	(2.07- 4.21)	4.21	(3.06- 5.76)	85/ 68.01
First sex before 16?					
No	61.22	(58.20- 64.15)	63.58	(60.90- 66.18)	1783/1188.57
Yes	38.78	(35.85- 41.80)	36.42	(33.82- 39.10)	1214/717.09
Age difference with first partner					
Younger partner	17.87	(15.62- 20.37)	3.49	(2.62- 4.62)	278/205.99
Same age	59.46	(56.58- 62.28)	35.89	(33.32- 38.53)	1376/910.05
Older partner	22.67	(20.33- 25.19)	60.63	(57.95- 63.24)	1328/781.39

5.2 Comparing the socio-demographics of respondents aged 16-24 who have ever had heterosexual intercourse with those who have not

In restricting analyses to 16-24 year olds who have ever had heterosexual intercourse, the sample is likely to over-represent those who started having sex at younger ages. Figure 6 compares participants who have never had heterosexual sex (and therefore cannot be included in analyses relating to 'sexual competence') with those who have had heterosexual intercourse, on key socio-demographic variables. Participants who have never had sex do not significantly differ to those who have had sex according to IMD (Index of Multiple Deprivation¹) quintile of area of residence and parental social class. However, compared with those who have never had sex, a greater proportion of sexually active respondents have lower levels of education and grew up in a one parent household. Furthermore, respondents of Asian, Black, or Chinese ethnicity are under-represented in the sexually active sample.

Figure 6: Comparing participants who have never had heterosexual sex with sexually active sample



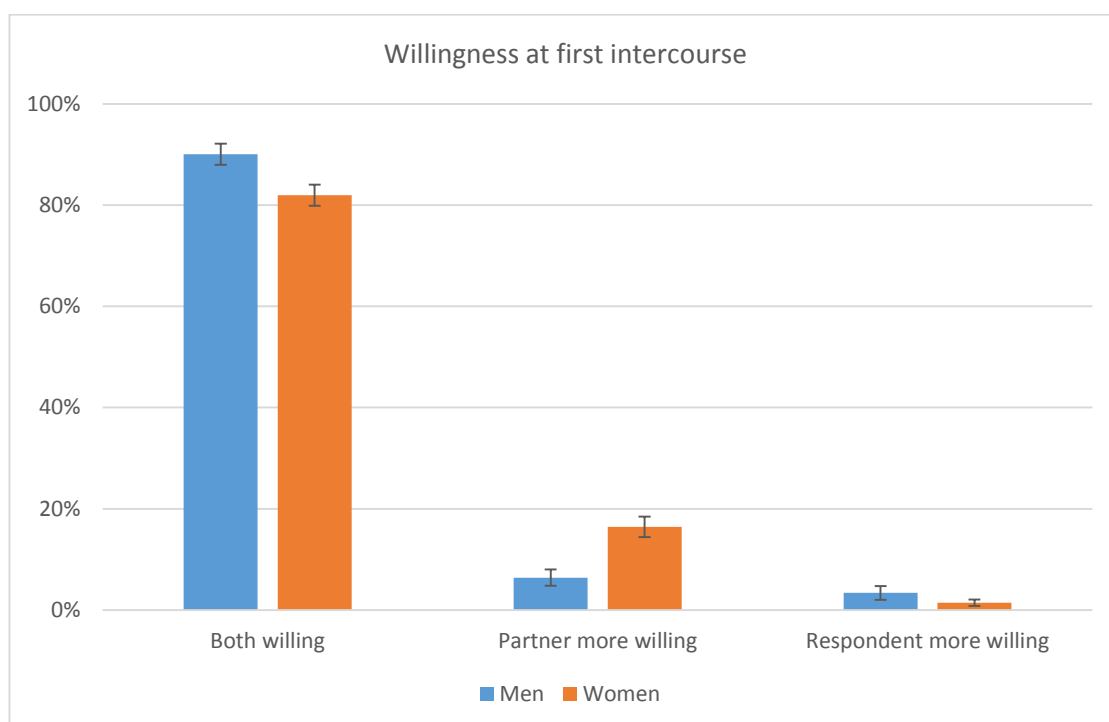
¹ Adjusted to ensure comparability across England, Scotland and Wales using a method by Payne and Abel (2012)

5.3 Sexual competence questions

Figure 7, Figure 8, Figure 9, Figure 10, and Figure 11 present the proportions of sexually active 16-24 year old respondents who selected each answer category for the Natsal-3 questions used to construct the measure of sexual competence at first intercourse.

Figure 7 shows that the most common response to the Natsal-3 question about willingness at first intercourse was 'both partners equally willing'. A gender difference was observed whereby a greater proportion of women than men reported that their partner was 'more willing'.

Figure 7: Willingness at first intercourse (n=2997/1899)



In the Natsal-3 questionnaire, respondents who gave the initial answer of 'partner more willing' were routed to a follow-up question; the responses to which are presented in Figure 8. Of those who reported that their partner was 'more willing' at first intercourse, very few reported that they were 'forced' (7% of women and less than 1% of men), while 55% of women and 35% of men stated that they 'had to be persuaded'.

Figure 8: Of those reporting partner more willing at first sex, percentage also willing, persuaded, and forced (n=347/216)

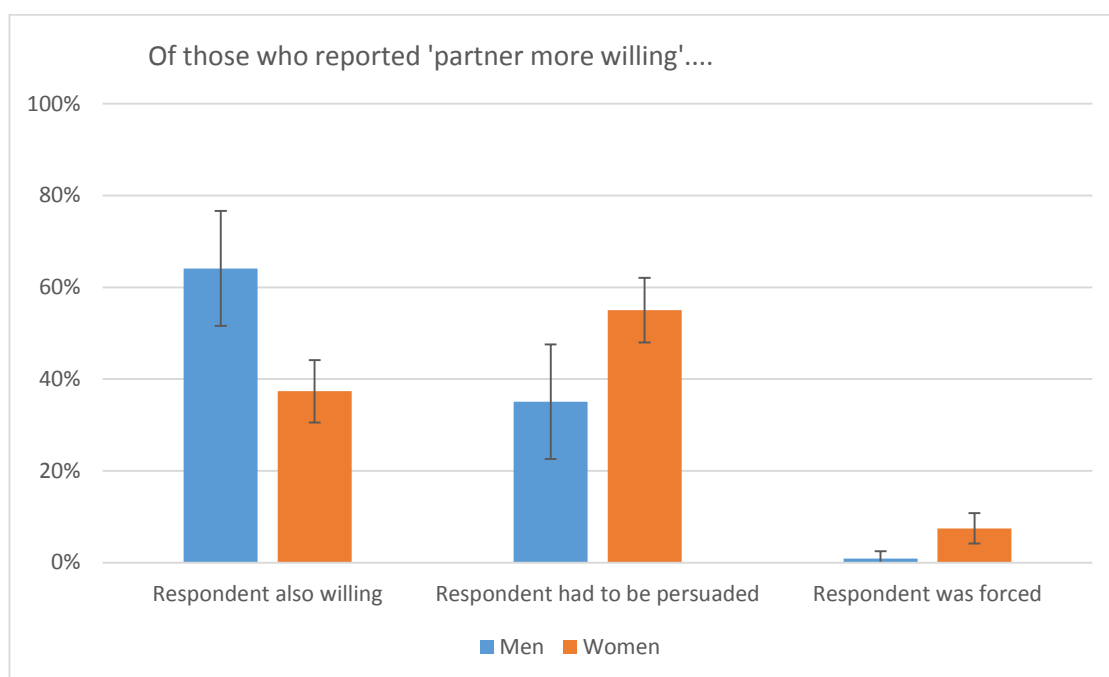


Figure 9 shows that around 60% of women and over 70% of men felt that their first intercourse occurred at 'about the right time'. Over a one-third of women and one-fifth of men stated that they 'wished they had waited longer'. The least commonly selected answer was 'should not have waited so long'.

Figure 9: Timing of first intercourse (n=2971/1888)



Figure 10 presents the proportions of sexually active 16-24 year olds who gave each 'reason' for first intercourse. The three most commonly selected answer options were 'I was curious about what it would be like', 'felt like a natural follow-on in the relationship', and 'I was in love'. Men more frequently reported that they were 'curious' while the 'I was in love' answer option was more commonly selected by women. 11% of female respondents and 7% of male respondents selected the 'most people in my age group seemed to be doing it' answer option, and around 5% of respondents reported that they were 'a bit drunk at the time'.

Figure 10: Main 'reason' for first intercourse (n=2957/1879)

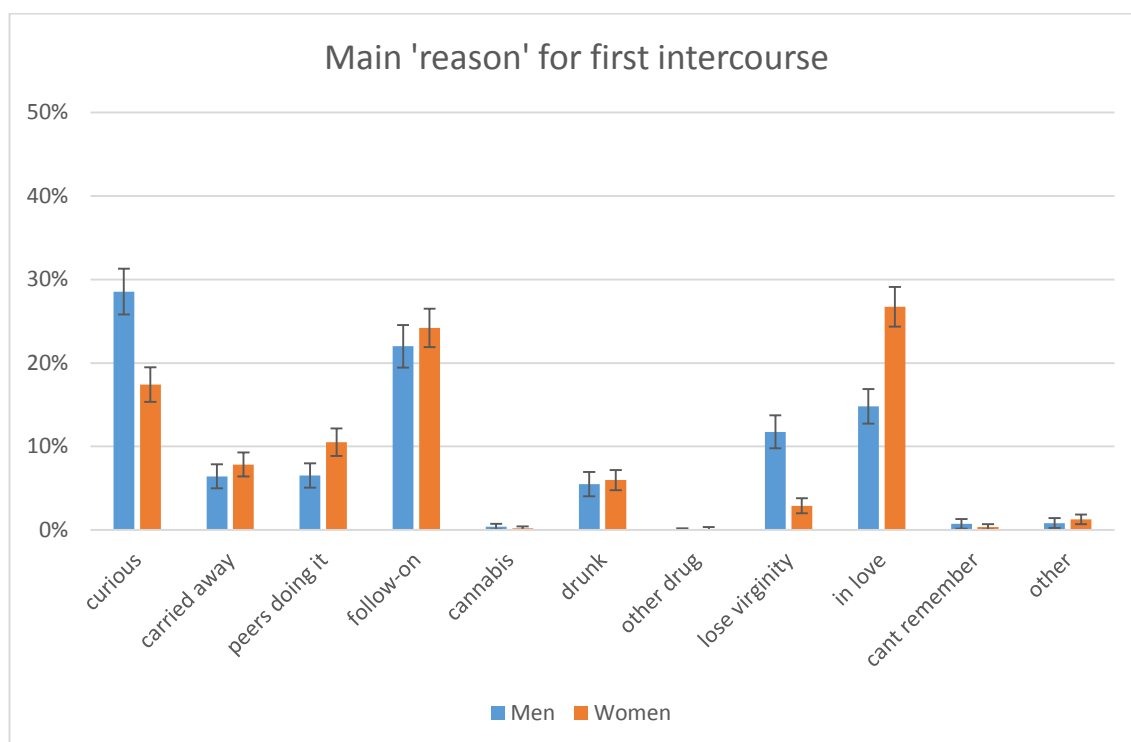
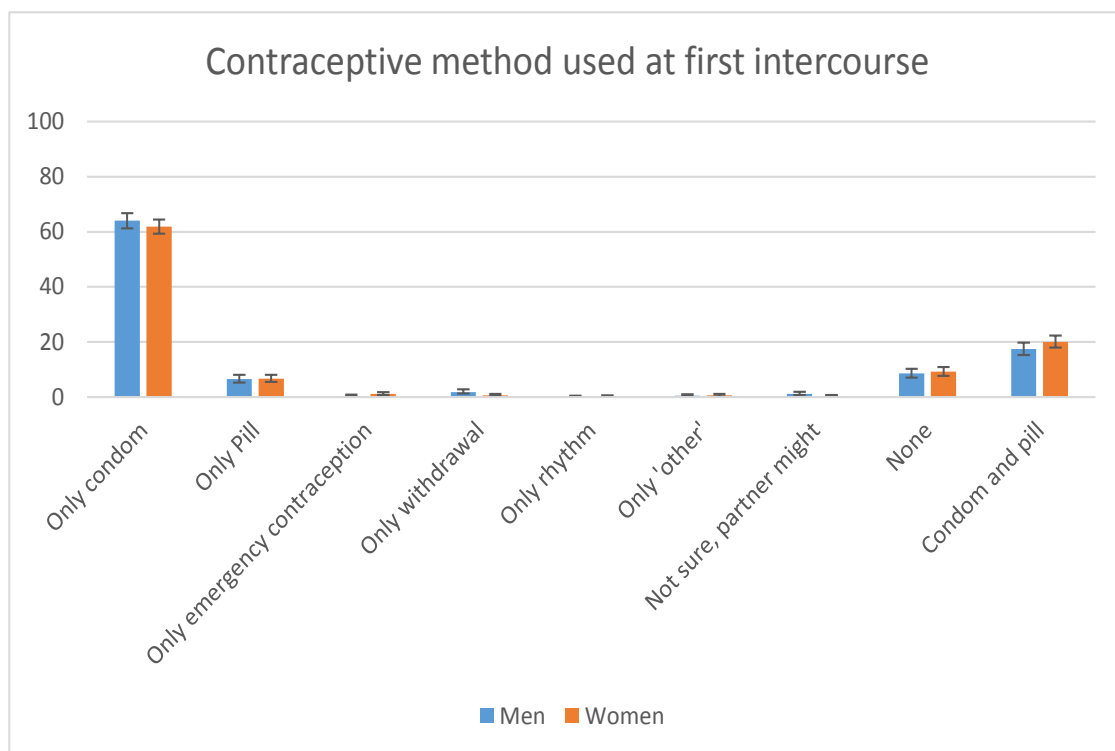


Figure 11 shows that the majority (>60%) of sexually active 16-24 year olds reported that they used only a condom at first intercourse, while 6% reported that they or their partners used the contraceptive pill. Almost 20% reported using both a condom and the contraceptive pill at first sex. Around 10% reported that they had not used any form of contraception.

Figure 11: Contraceptive use at first intercourse (n=2985/1898)



5.4 Missing data

For the majority of variables used in the analyses presented in this thesis, including the questions used to construct the sexual competence measure, missing data was very low with non-response ranging from 0 to 2% among the 16-24 year old sexually active sample.

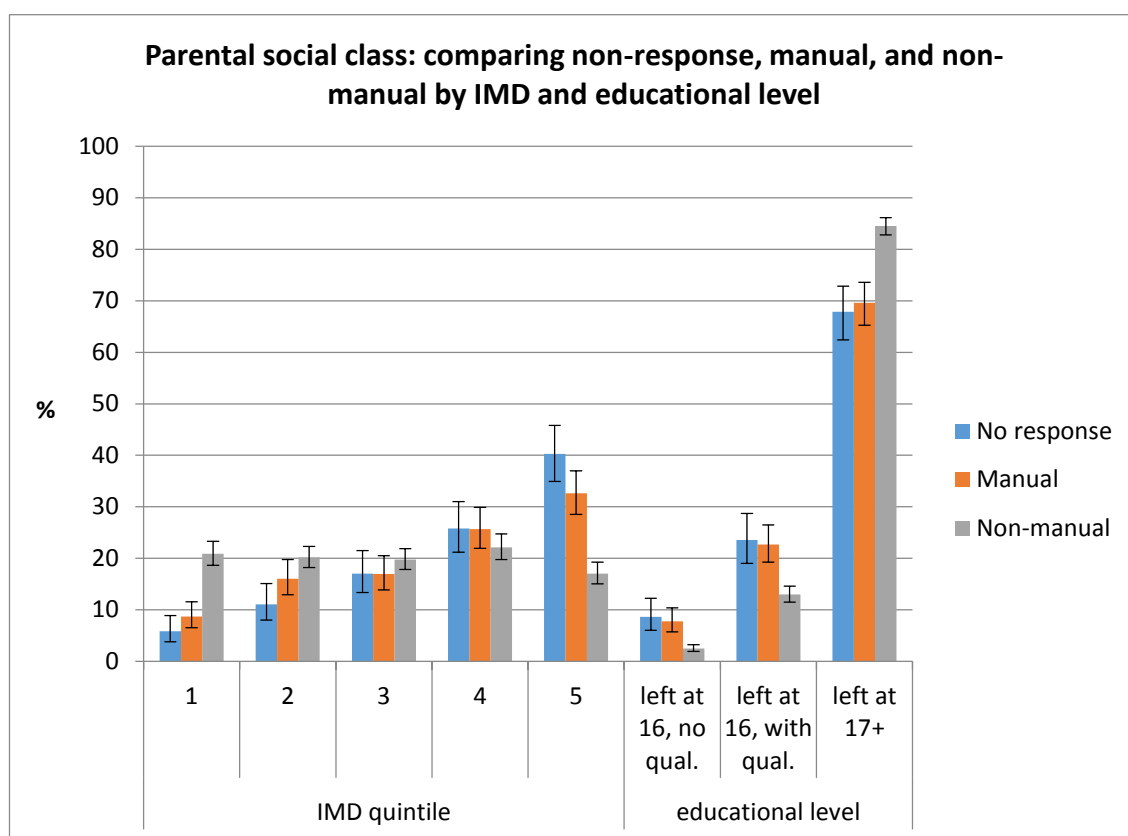
Two variables had notably higher proportions of data missing. Parental social class had particularly high non-response at 10.4% (n=318), and the strategy to deal with this is described below. The variable relating to educational level was missing for all 16 year old respondents (equating to 5.6% (n=194) of the young sexually active sample), as they had not yet finished education, and so their achieved educational level was unknown. In order that 16 year old respondents were not dropped out of regression analyses, an additional category of 'currently 16' was incorporated into the educational level variable – although this extra category has little substantive meaning, it was felt necessary to ensure that the analyses pertained to the entirety of the sexually active 16-24 year old age group.

5.4.1 *Parental social class*

Respondents were asked about their parents' occupations, from which a variable categorising parental social class as manual or non-manual was derived. Among the 16-24 year old participants, 318 (10.4%) were unable to answer this question and therefore, a substantial proportion of the young sample had missing data for this variable. In order to avoid this proportion of respondents dropping out from further analyses, a third category labelled 'no response' group was added to the social class variable.

Figure 12 compares the 'no response', manual, and non-manual categories of parental social class against two other indicators of socio-economic status (IMD quintile of area of residence and educational level) in order to assess the properties of the extra 'no response' group. The results indicate that the 'no response group' does not significantly differ from the 'manual' category according to IMD quintile of residence or educational level, suggesting that the 'no response' group is of similar socio-economic status as the manual group. The 'no response' group and manual group do significantly differ from the non-manual group, with a greater proportion of the non-manual category living in less deprived areas and gaining a higher level of education. Given the 'no response' group may differ from the manual category according to other characteristics, it has not been collapsed into the manual group, but is included as its own distinct category in analyses.

Figure 12: Parental social class with 'no response' category by IMD quintile of residence and educational level



6. Chapter 6: Latent variable analysis

This chapter consists of 3 sections, all of which use methods from the latent variable framework in order to empirically assess the measure of sexual competence at first intercourse:

- 1. Assessing the construct validity of the sexual competence measure using confirmatory factor analysis of Natsal-3 data**
- 2. Assessing whether, and how many, meaningful categories of 'sexual competence' can be derived using a latent class analysis of Natsal-3 data**
- 3. Assessing whether 'enjoyment' might be an additional component of the measure of sexual competence using confirmatory factor analysis of data from the Avon Longitudinal Study of Parents and Children (ALSPAC)**

6.1 SECTION 1: A confirmatory factor analysis of the measure of sexual competence

6.1.1 *Introduction*

The timing of first sexual intercourse has long been of considerable public health interest, though the way in which timing is conceptualised has changed. While the emphasis was once on ensuring sexual intercourse did not occur before marriage, in recent decades the moral and research focus has turned to age at occurrence – particularly ‘early’ first sex, defined as that which occurs before the age of consent or age of the majority. The adoption of a universal standard for judging the appropriateness of timing of first intercourse does not, however, take account of differences in physical, social and psychological maturity and readiness between individuals. There is also considerable cultural, racial and ethnic variation in the timing of sexual initiation (Fenton et al., 2005).

To date, few attempts have been made to interpret timing of first intercourse in terms of attributes other than chronological age, such as readiness or appropriateness. A competence-based approach to sexual development focuses on how young people become sexually active in a safe and healthy manner that minimises their risk of negative experiences and developmental outcomes (Gross, 2009). Hirst (2008) uses the term ‘sexual competence’ as referring to the “ability to be involved in sexual practices with successful processes and outcomes” (p.6). The successful outcome posited by Hirst is that of a positive sexual experience which reflects the WHO definition of sexual health i.e. maintaining physical health through the avoidance of STIs and unintended pregnancy, and also emotional health through experiencing minimal or no regret, and perhaps even having derived pleasure from the activity. Hirst also considers the ‘processes’ necessary to achieve these outcomes, such as a successful interactional process between the two partners which would result in the sexual experience being chosen equally by both partners (lack of coercion) and involving negotiation over what activities were and were not to happen, such as the use of contraception.

The concept of ‘sexual competence’ was most notably first operationalised by Wellings et al (2001). Respondents in the Second National Survey of Sexual Attitudes and Lifestyles (Natsal-2) were classified as ‘sexually competent’ at sexual debut if they reported that the encounter was characterised by equal willingness of both partners, autonomy (not influenced by peer pressure or alcohol), the use of a reliable method of contraception and acceptable timing (that is, it happened at what they considered to be the ‘right time’).

The construction of this measure was based on the Natsal researchers' assessment about what conditions constitute a healthy, safe, and ideal first sexual encounter and, as demonstrated by the coding, the idea that each one of the four components must be endorsed for an individual to be deemed sexually competent at sexual debut. This measure exhibits good face validity as these components fit well with the definition of sexual health endorsed by the World Health Organisation, which emphasises the importance of physical, along with emotional and mental health (WHO, 2006). However, the extent to which these four variables correlate with one another and measure an underlying common construct has as yet been unexplored.

This section seeks to present an empirical assessment of the construct validity of this measure, that is, whether the four manifest items (equal willingness, right time, autonomous reason, and contraceptive use) are tapping into a single common underlying construct as hypothesised by the researchers responsible for the derivation of the measure in Natsal-2 and 3, who proposed that these four items were indicative of respondents' 'sexual competence' at first sex. The analyses below were conducted using confirmatory factor analysis (CFA), a methodology from the latent variable framework. Additionally, we explored how the CFA measurement models differ between men and women, i.e. whether the construct of 'sexual competence' at sexual debut, as measured by the four manifest items, differs empirically between male and female respondents.

Specifically, the aim of the analysis was to assess the evidence that the four components making up the measure of sexual competence measure a single underlying latent construct, using confirmatory factor analysis.

6.1.2 Methods

Participants and Measures

Data from the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3) were analysed. Natsal-3 is a stratified probability sample survey of approximately 15162 men and women aged 16-74 resident in Britain conducted in 2010-2012. Participants were interviewed using a combination of face-to-face, computed-assisted personal interviews and computer-assisted self interviews.

Analyses were conducted using the sample of men and women aged 16-24 at interview, who had ever had heterosexual intercourse. Respondents who were living together or married at first sex (n=22) were not asked about their reason for first sex, and therefore are excluded from the

following analyses. Analyses were repeated separately for men and for women, to allow for the identification of gender-specific differences in the CFA measurement model.

Figure 13: Natsal-3 questions used to construct 'sexual competence' at sexual debut measure. Highlighted are the answers that must be given for a respondent to be classified as sexually competent at sexual debut.

Concept	Natsal-3 Questions	Coding
Willingness of partners	Q: Would you say you were both equally willing to have intercourse that first time, or was one of you more willing than the other? A: 1. Both equally willing 2. Respondent more willing 3. Partner more willing	Equally willing = 1 if answer = 1 Equally willing = 0 if answer = 2 or 3
Timing	Q: Looking back now to the first time you had sexual intercourse, do you think.... A: 1. You should have waited longer before having sex with anyone 2. That you shouldn't have waited so long 3. It was at about the right time	Right time = 1 if answer = 3 Right time = 0 if answer = 1 or 2
Autonomous reason	Q: Which one of these applied to you at the time.... (choose the main one that applied at the time) A: 1. I was curious about what it would be like 2. I was carried away by my feelings 3. Most people in my age group seemed to be doing it 4. It seemed like a natural 'follow on' in the relationship 5. I was a bit drunk at the time 6. I had smoked some cannabis 7. I had take some other drugs 8. I wanted to lose my virginity 9. I was in love 10. Can't choose/more than one main factor	Autonomous reason = 1 if answer =1 or 2 or 3 or 4 or 8 or 9 Autonomous reason = 0 if answer = 3 or 5 or 6 or 7
Use of reliable method of contraception	Q: Thinking of that first time you had sexual intercourse, did you or your partner use any form of contraception or take any precautions that first time, or not? A: 1. Condom 2. The pill 3. Emergency contraception 4. Other contraception 5. (Partner) withdrew 6. Made sure it was a safe period 7. No precautions by me, don't know about partner 8. No precautions by either of us	Reliable contraceptive protection = 1 if answer = 1 or 2 Reliable contraceptive protection = 0 if answer = 3 or 4 or 5 or 6 or 7 or 8

Figure 13 shows the questions asked in Natsal-3 regarding first heterosexual intercourse which are used to construct the measure of 'sexual competence'. The response categories which need to be endorsed in order to demonstrate 'sexual competence' at sexual debut are highlighted and the coding of the resulting four binary variables is shown. For a respondent to be classified as sexually competent s/he must positively endorse each condition, i.e. be coded: equally willing=1 AND right time=1 AND autonomous reason=1 AND use of reliable contraceptive=1. Should a respondent report any other combination of responses then they are classified as not sexually competent at first sexual intercourse.

Statistical Analysis

The underlying phenomenon or construct that a scale or measure is intended to reflect is often called the 'latent variable' (DeVellis, 2003). Latent variable models are based on the assumption that certain manifest or observed items (for example, the questions asked in Natsal-3 regarding first sex) are dependent on the same latent variable(s), and this dependence causes there to be a correlation among these items. That is, the latent variable is considered to be a cause of the responses to the manifest items under study i.e. the strength of the latent variable causes the set of manifest items to take on certain values, and so, the correlations between the observed items are explained by the latent variable (DeVellis, 2003).

Factor analysis models may be used in an exploratory manner with the aim of identifying the number of latent variables that underlie a set of items, or in a confirmatory way, to test a priori hypothesis that a set of items intended to measure a particular underlying construct are consistent with the assumed structure (Bartholomew et al., 2008). Confirmatory, as opposed to exploratory, factor analysis (CFA) is employed in the current study. In the context of this study, it is hypothesised that a single latent variable represents the construct 'sexual competence' which determines the scores of the observed items: autonomous reason, equal willingness of partners, right time, and contraceptive use. From the correlations observed between the manifest items, the strength of the association ('factor loading') between each of the observed indicators and the latent variable is estimated i.e. factor loadings represent regressions of the observed indicators on the latent variable. The model also calculates a 'threshold' parameter which indicates the value of the latent construct that needs to be reached for a particular response option to be endorsed. Factor analysis assumes that the underlying latent variable is continuous and assigns each case or individual a factor score determined by their combination of endorsed manifest items and weightings based on the factor loadings estimated by the model; these factor scores can then be used as a continuous variable in further analyses.

Using Mplus 7 (Muthen and Muthen, 2007), CFA was conducted with the four binary variables relating to the experience of first sexual intercourse described above: equal willingness, right time, autonomous reason, and use of reliable contraception, using data from Natsal-3 respondents aged 16-24 at interview who had ever had heterosexual intercourse. Analyses were conducted among the pooled male and female sample, as well as separately by gender to allow for the identification of gender differences. The 'complex' command was used to account for the clustering, stratification and weighting of the survey data.

The CFA models were estimated using weighted least squares with a diagonal weight matrix, robust errors, and a mean- and variance-adjusted chi-square (WLSMV), which simultaneously analyses the tetrachoric correlation and asymptomatic covariance matrices. The use of the WLSMV estimator for binary data is recommended by Muthen and Muthern (2007), and Beauducel and Herzberg (2006), whose simulation study confirmed the superiority of the WLSMV estimator for factor analysis using variables with a small number of categories, in this case, dichotomous variables. Goodness of fit of the measurement models was assessed using the following criteria; Comparative Fit Index (CFI) ≥ 0.95 , Tucker Lewis Index (TLI) ≥ 0.95 , Root Mean Square Error of Approximation (RMSEA) ≤ 0.05 , as recommended by Yu (2002) for when working with binary indicators. The Chi-squared test p-value ≥ 0.05 is also considered, though must be recognised as a particularly conservative test statistic, which due its sensitivity to sample size, can be inclined to reject adequately fitted models where the sample size is large (Yu, 2002). In assessing the strength of the standardised factor loadings, we employ Brown's (2006) guidelines, advising that factor loadings equal to or greater than 0.3 or 0.4 be considered salient, that is, the indicator is meaningfully related to the latent factor.

6.1.3 Results

Descriptive Statistics

Table 4: Percentage (95% confidence interval) of male and female Natsal-3 respondents aged 16-24 at interview who positively endorse each of the four items which are used to measure 'sexual competence' at sexual debut.

	Right time	Autonomous Reason	Equal Willingness	Use of reliable contraception	Sexually competent (four items endorsed)	N (unweighted/weighted)
Men	73.0% (70.2-75.8)	87.4% (85.4-89.4)	90.2% (88.2-92.2)	89.7% (88.0-91.2)	56.3% (53.2-59.4)	1320/968
Women	60.4% (57.9-63.0)	83.1% (81.2-85.0)	83.1% (80.9-85.1)	88.1% (86.2-89.7)	48.7% (46.0-51.4)	1657/924

Table 4 presents the proportions of Natsal-3 respondents aged 16-24 at interview who report that their sexual debut was at the right time, for an autonomous reason, with equal willingness of both partners and using a reliable method of contraception. Statistically significant (at the 5% level) gender differences are observed in two of the four items: 60.4% of women compared to 73.0% of men report that their sexual debut happened at the 'right time', and 83.1% of women compared to 90.2% of men report that they were equally willing at sexual debut. Gender differences in endorsement of the other items, autonomous reason and contraceptive use, are less pronounced, and the latter was not statistically significant at the 5% level. Significantly more men positively endorsed all four items, i.e. were 'sexually competent' at first sex, compared with women (56.3% versus 48.7%).

Table 5 and Table 6 present the tetrachoric correlation coefficients between each of the four items which make up the measure of sexual competence at sexual debut. This analysis shows that all the correlations are positive in direction and statistically significantly differ from zero, with all p-values <0.05. Furthermore, all of the correlation coefficients are low enough to conclude that none of the pairs of variables seem to be measuring the exact same trait. With the exception of the correlation coefficient between contraceptive use and equal willingness, all of the inter-item correlations are of greater magnitude in the female sample, compared with the male-only sample.

Table 5: Tetrachoric correlation coefficients and p-values for the correlations between the four sexual competence items. Men only (n=1314).

Men		Equal willingness	Right time	Autonomous reason	Contraceptive use
Right time	Correlation coefficient	0.252			
	P-value	<0.001			
Autonomous reason	Correlation coefficient	0.162	0.374		
	P-value	0.026	<0.001		
Contraceptive use	Correlation coefficient	0.214	0.207	0.266	
	P-value	0.003	<0.001	<0.001	

Table 6: Tetrachoric correlation coefficients and p-values for the correlations between the four sexual competence items. Women only (n=1633).

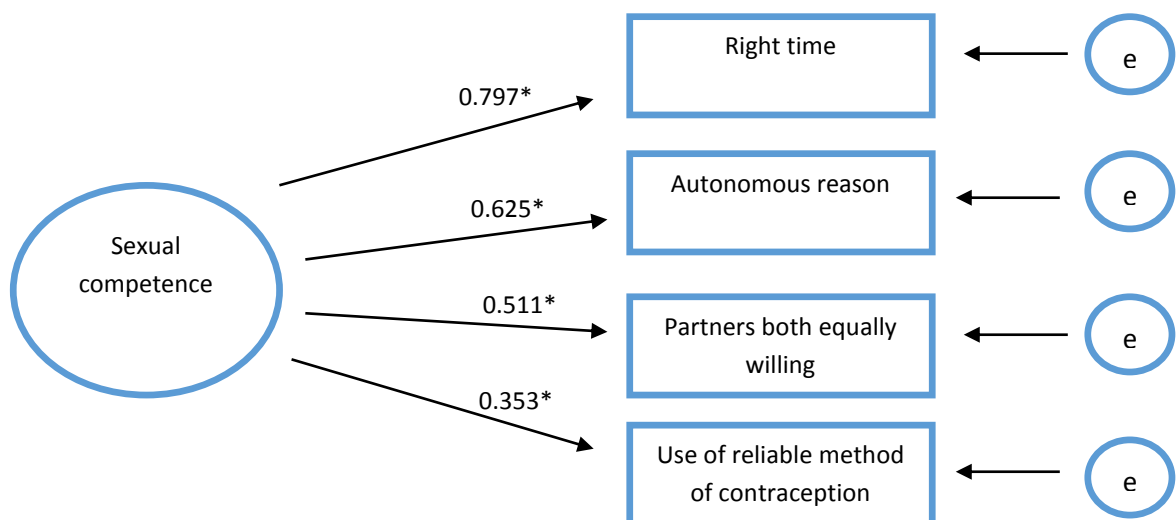
Women		Equal willingness	Right time	Autonomous reason	Contraceptive use
Right time	Correlation coefficient	0.584			
	P-value	<0.001			
Autonomous reason	Correlation coefficient	0.353	0.550		
	P-value	<0.001	<0.001		
Contraceptive use	Correlation coefficient	0.182	0.375	0.344	
	P-value	0.001	<0.001	<0.001	

Confirmatory Factor Analysis: men and women pooled sample

Figure 14 shows the results of CFA using Natsal-3 data for male and female respondents aged 16-24 at interview. As a general rule for assessing the strength of factor loadings to decide whether the items are good indicators of the latent variable, a loading of >0.3 or >0.4 is acceptable (Brown, 2006). Figure 14 shows that the item 'right time' loads particularly strongly (factor loading: 0.797) on the latent variable termed 'sexual competence', followed by 'autonomous reason' with a slightly lower factor loading of 0.625 and 'equal willingness' with a loading of 0.511. The variable, 'use of reliable method of contraception' has the lowest factor loading of 0.353.

With a Comparative Fit Index (CFI) of 0.994 and Tucker Lewis Index (TLI) of 0.981 the model is a good fit to the data; any value over 0.95 for these indices indicates that the data fit the model well, as does a Root Mean Square Error of Approximation (RMSEA) of less than 0.06 (Yu, 2002). Even the rather conservative χ^2 test demonstrates good fit, with a high p-value of 0.0902 meaning that the model predicts a covariance matrix that is similar to the observed covariance matrix. The 'e' (error) variables represent variables other than sexual competence that influence each manifest item. These 'e' variables are unique for each observed item and represent the residual variation in each item that is not explained by sexual competence i.e. variation that is not shared by the four indicators.

Figure 14: Results from confirmatory factor analysis showing sexual competence as a latent construct affecting each manifest variable. Standardized factor loadings shown along arrows. Analysis restricted to respondents aged 16-24 at interview.



Sample	CFI	TLI	RMSEA	χ^2
Pooled	0.994	0.981	0.022	Value = 4.812 p=0.0902

*p≤0.001

Figure 15: Histogram of factor scores based on CFA model - pooled sample 16-24 year olds

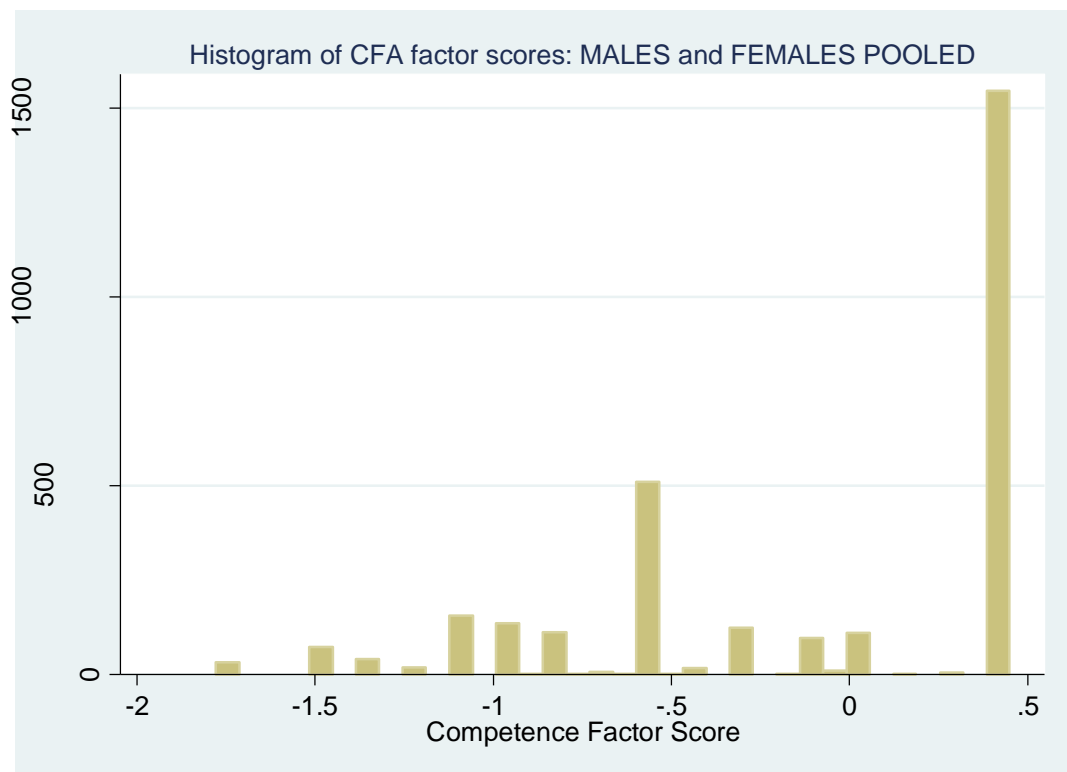
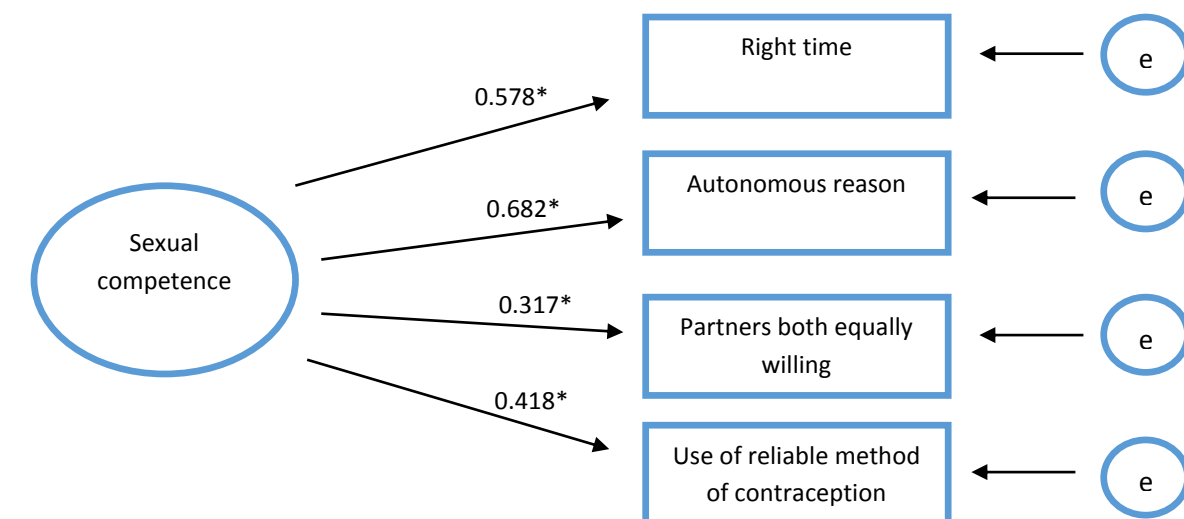


Figure 15 shows the histogram of the respondents' factor scores based on the pooled sample CFA model. The distribution of the factor scores is highly skewed; on the application of various modes of transformation to these scores, the distribution observed did not achieve normality. A natural 'threshold' is observed at the score of 0.451, whereby the sample might be split into different categories. As shown in Table 7, those scoring 0.451 are actually the respondents who endorse all four items i.e. the sexually competent respondents; meaning that a binary categorisation of sexual competence based of the factor scores from CFA offers a classification that is no different from that provided by the existing Natsal coding. Given that this CFA is based on just four binary variables, the degree of variability observed between respondents' response patterns is quite restricted, so limiting the variability present in the factor scores calculated and therefore, also limiting the utility of this measure as a continuous variable.

Table 7: Cross tab of sexual competence status of respondents, as defined by splitting the factor scores at the apparent threshold, and the originally Natsal-3 coding. (Pooled sample)

	Competence according to Natsal-3		Total
	Not competent	Competent	
Pooled factor score split at threshold			
Below threshold	1,414 100%	0 0%	1,414 100%
Above threshold	0 0%	1,533 100%	1,533 100%
Total	1,414 47.98%	1,533 52.02%	2,947 100%

Figure 16: Results from confirmatory factor analysis showing sexual competence as a latent construct affecting each manifest variable. Standardized factor loadings shown along arrows. Analysis restricted to MALE respondents aged 16-24 at interview.



*p≤0.001

Sample	CFI	TLI	RMSEA	χ^2
Male only	0.998	1.000	0.0002	Value = 0.679 p=0.7123

Figure 17: Histogram of factor scores based on CFA model - Male 16-24 year olds

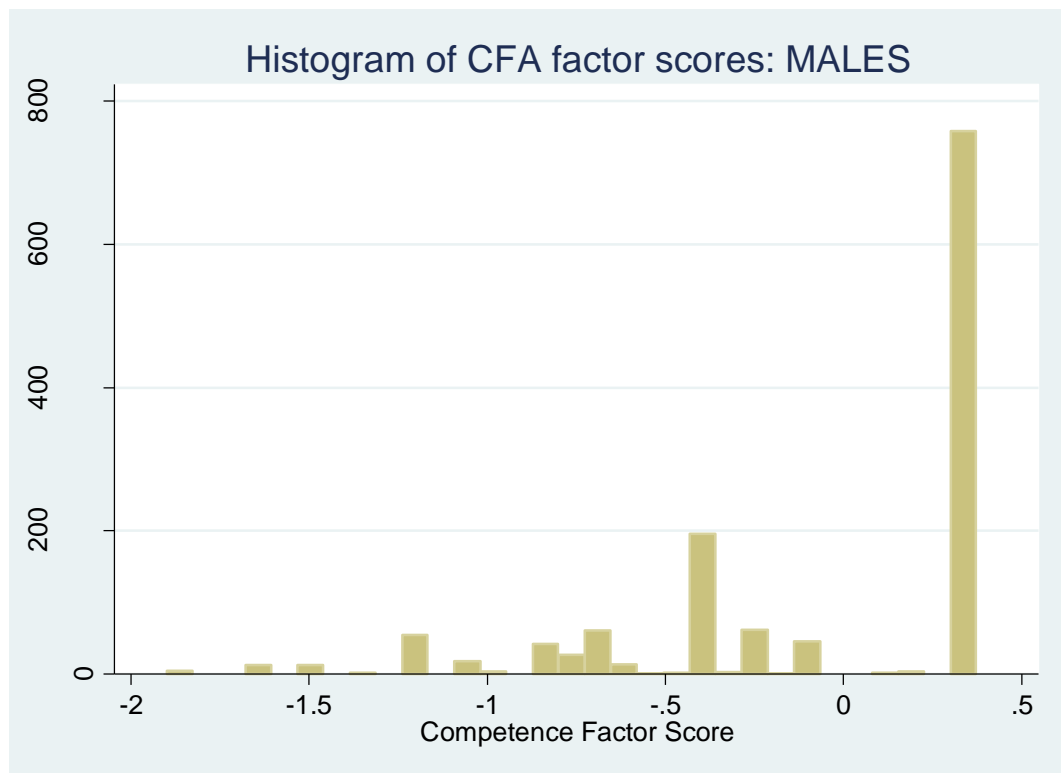


Table 8: Cross tab of sexual competence status of respondents, as defined by splitting the factor scores at the apparent threshold, and the original Natsal-3 coding. (Male-only sample)

	Competence according to Natsal-3		Total
	Not competent	Competent	
Male factor score split at threshold			
Below threshold	556 100%	0 0%	556 100%
Above threshold	0 0%	758 100%	758 100%
Total	556 42.31%	758 57.69%	1,314 100%

Figure 16 and Figure 18 show the results of the confirmatory factor analyses among men only and women only, respectively. The gender-specific CFA models show differences in the factor loadings estimated by the measurement models, however the fit indices of the two models indicate a good quality of fit to female-only and male-only data.

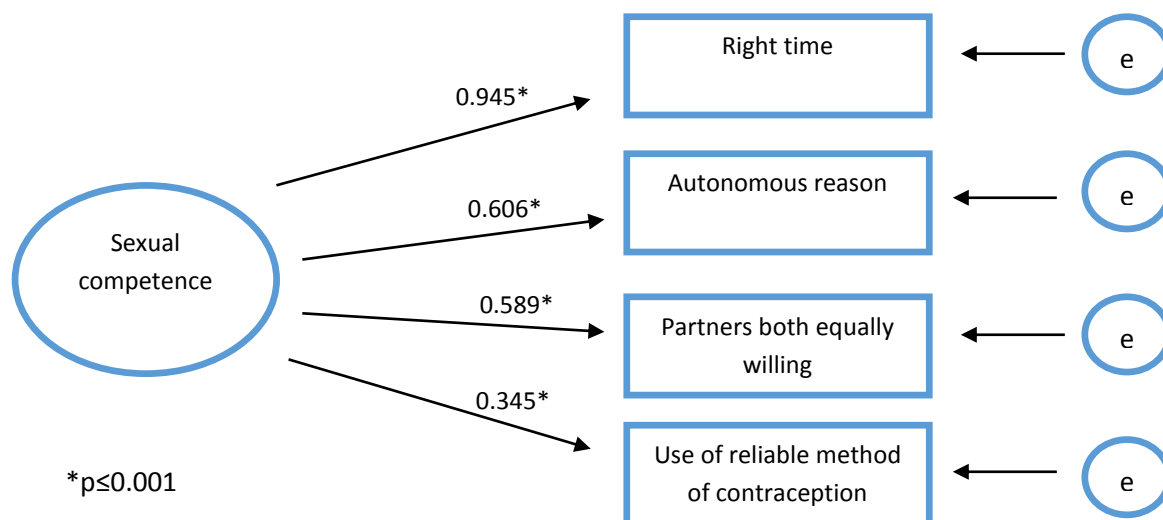
Among women, ‘right time’ has the largest factor loading of 0.945 and therefore seems to be the most important function of sexual competence, followed by autonomous reason (factor loading: 0.606), ‘equal willingness’ (factor loading: 0.589), and contraceptive use with the lowest loading of 0.345.

Among men, a different pattern is observed, whereby the highest factor loading of 0.682 relates to 'autonomous reason', making autonomy of decision the most important function of sexual competence among men, followed by 'right time' with a factor loading of 0.578, contraceptive used (factor loading: 0.415), and equal willingness with the lowest factor loading of just 0.317.

Figure 17 shows the histogram of factor scores derived from the male-only CFA model. The factor scores are highly skewed, with an obvious threshold at 0.374 corresponding to the respondents who endorsed each of the four items (shown in Table 8). Figure 19 shows the histogram of the factor scores for female respondents; again the factors scores are not normally distributed, with particularly high number of individuals scoring 0.416 corresponding to those women endorsing each of the four items, as shown in Table 9.

Confirmatory Factor Analysis: Women

Figure 18: Results from confirmatory factor analysis showing sexual competence as a latent construct affecting each manifest variable. Standardized factor loadings shown along arrows. Analysis restricted to FEMALE respondents aged 16-24 at interview.



Sample	CFI	TLI	RMSEA	χ^2
Female only	0.996	0.988	0.023	Value = 3.766 p=0.1521

Figure 19: Histogram of factor scores based on CFA model – Women only 16-24 year olds

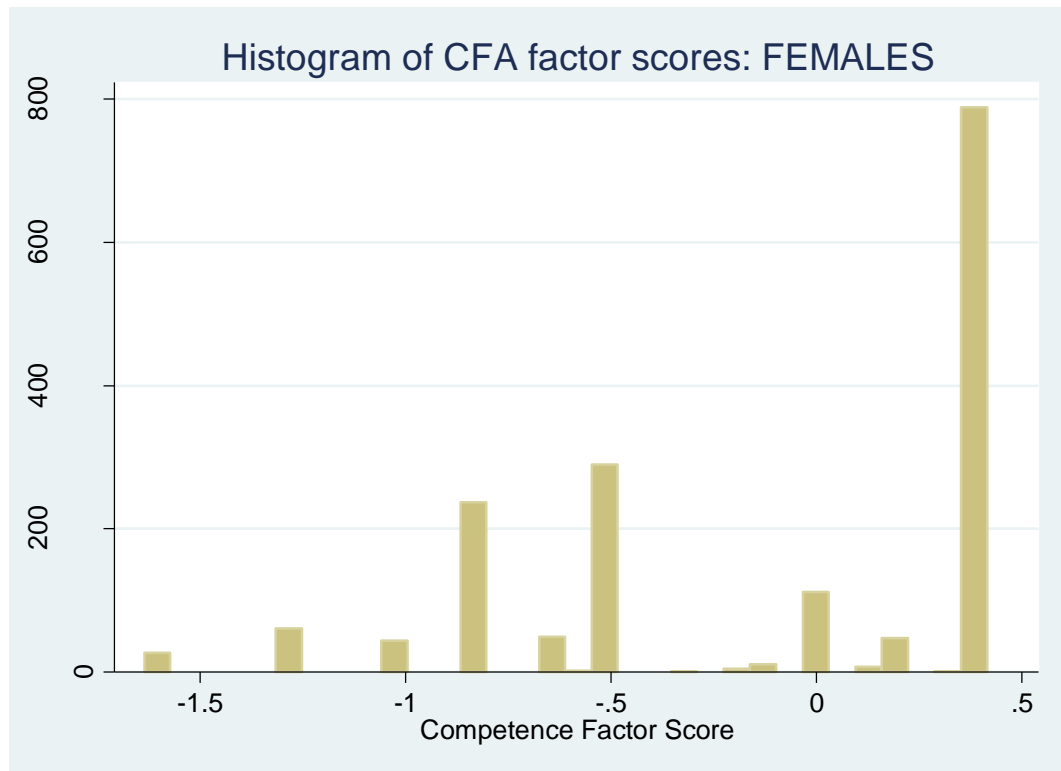


Table 9: Cross tab of sexual competence status of respondents, as defined by splitting the factor scores at the apparent threshold, and the original Natsal-3 coding. (Female-only sample)

	Competence according to Natsal-3		Total
	Not competent	Competent	
Female factor score split at threshold			
Below threshold	858 100%	0 0%	858 100%
Above threshold	0 0%	775 100%	775 100%
Total	858 52.54%	775 47.46%	1,633 100%

6.1.4 Discussion

This study tests the hypothesis that the four items relating to the experience of first sexual intercourse: equal willingness, right time, autonomous reason, and contraceptive use, all tap into a single underlying latent variable. The goodness-of-fit indices, for both the pooled and gender-specific samples, are all well within the thresholds recommended by Yu (2002) indicating that this hypothesised structure of the measurement model fits the data well. Furthermore, all

the estimated factor loadings are statistically significantly different to zero (the null), and are of a magnitude greater than the cut-offs suggested by Brown (2006) in determining the salience of the loading between the observed item and latent variable. Importantly, the factors loadings are also in the direction of association expected, that is, all specify a positive association between each of the four items and the latent variable; indicating that greater 'sexual competence' at sexual debut is associated with greater likelihood of being equally willing, reporting that first sex happened at the 'right time', for an autonomous reason, and using a reliable method of contraception. Overall, these findings are consistent with, and provide evidence for, the hypothesised structure of the 'sexual competence' at sexual debut measure developed by Natsal researchers (Wellings et al., 2001).

The current study also indicates the presence of differences according to gender in the answers given to the four items under focus, along with how they correlate with one another. These differences were observed in descriptive analyses, and were also apparent in the gender-specific CFA models. In line with the current findings, previous analyses of Natsal-2 indicated that compared to women, men were more likely to report that their first sexual intercourse happened at the 'right time' and that both partners were equally willing to engage in sexual intercourse (Wellings et al., 2001). These findings are also consistent with a New Zealand cohort study, which identified pronounced gender differences in mutual willingness and retrospective views of appropriate timing, in the same direction (Dickson et al., 1998).

Not surprisingly, the most pronounced differences in the gender-specific CFA factor loadings were also observed for the variables relating to the timing of sexual debut and equal willingness of partners. Among women, the 'right time' variable loaded on the sexual competence latent variable particularly highly at 0.945, whereas among men this was a more modest 0.578, and similarly, the loading of the 'equal willingness' variable was almost doubled in magnitude in the female only sample (0.589), compared with the men (0.317). The relatively lower factor loadings of these indicators suggest that the latent variable termed 'sexual competence' explains less of the variance within these items among the male sample, compared with the female sample. This is also illustrated by the correlation matrices (Table 5 and Table 6), whereby the majority of the inter-item correlations are of lower magnitude among men, compared with women.

First sexual intercourse has been found to have different meanings for men and women. Carpenter's (2007) qualitative study of 61 men and women in the US identified distinct ways in which respondents framed their virginity – women were more likely to consider it as a 'gift', something to be valued and not given away lightly, emphasising the need for reciprocation through love and commitment, whereas men more commonly perceived their virginity as a

'stigma', something negative to be got rid of, preferably at the first available opportunity. These general gender differences in the way virginity is viewed were confirmed in a Canadian survey, which operationalised these themes in survey questions (Humphreys, 2012). Furthermore, Ingham et al's (1991) qualitative study involving 16-25 year olds from Hampshire and Berkshire found that generally, most male respondents felt happy about their first sex, even describing it as 'brilliant', while women were more likely to express regret about how or with whom the intercourse took place. Therefore, the current finding that men's evaluation of whether intercourse happened at the 'right time' is less dependent on the other conditions relating to first sex may be due to the tendency of men to generally give a more positive evaluation of their first sex, irrespective of the wider nature of the experience, simply because they are pleased that it happened, perhaps particularly that they had ridden themselves of their perceived 'stigma' of virginity. Whereas for women, the judgement of the whether first sex happened at the right time is more dependent on the nature of the first sexual experience and the interaction with the partner; a finding consistent with previous research emphasizing the importance of the relational context in women's evaluation of their sexual experiences (Carpenter and Garcia, 2007; Narring et al., 2000).

The poorer functioning of the item 'equal willingness' in the male-only CFA model may be explained by the particularly high proportion of men reporting that both partners were equally willing at first sex of 90.2%, meaning there is a low degree of heterogeneity in this measure among the male-only sample. Furthermore, that the answer to this question correlates less well with the responses given on the other three items may be due to the perceived connotations of giving certain answers to this survey question. The proportions of men and women reporting 'equal willingness' at first sex do not add up – a greater proportion of women report that their partner was more willing, than men reporting that they were more willing. While this may be due to men genuinely not recognising when their female partner feels pressured, it may also be that men do not feel comfortable reporting that they were more willing than their partner at first sex, given the connotations of rape which may spring to mind (a researcher working on qualitative study with young people reported men's sensitivity to perceived connotations of rape when discussing willingness (personal communication with Ruth Lewis)). Similarly, reporting that their female partner was 'more willing' at sexual debut is at odds with the masculine sexual script dictating that men should be the active, sexually-keen partner (Dworkin and O'Sullivan, 2007). Therefore the poor performance of this variable may be due to the difficulty answering this question that is specific to men – such that their response is less dependent on their answers to the other three items.

In the pooled and both male-only and female-only samples, the CFA models estimated a relatively low factor loading between the latent variable and use of a reliable method of contraception. The lower factor loading indicates that less of the variance in contraceptive use is explained by the latent variable of sexual competence, compared with the other observed components - demonstrating that the inter-item correlations are greatest among; 'right time', 'autonomous reason', 'partners both equally willing', while 'contraceptive use' does not correlate so highly with these items. This may be interpreted to mean that there are many young people who, despite it not being the 'right time' or not being 'equally willing' or not having an 'autonomous reason' for having sex, still use a method of contraception. Such a finding may be plausible given that one of the most straightforward health messages about having sex is that one must use 'protection', and this action may happen even when an individual is lacking on other components of sexual competence.

Alternatively, it may be that young people are having autonomous, non-coercive sex which they do not regret, but are not using reliable forms of contraception; perhaps the good performance on the more psycho-sexual variables is indicative of 'loving' and 'stable' relationships and that, as reported in other research, these young people feel that condom use is not necessary in the context of a loving and trusting relationship (Sheeran et al., 1999; Gebhardt et al., 2006; Gebhardt et al., 2003; Bauman and Berman, 2005). Although this variable also includes the use of the contraceptive pill, approximately 80% of 16-24s reported the use of a condom at sexual debut, while only 6% reported using only the contraceptive pill (shown in Chapter 5), meaning condom use will have been the main contraceptive method contributing to the score gained on the 'use of a reliable method of contraceptive' item.

Religiosity may also play such a role; previous research has found that stronger religious beliefs, and increased attendance to religious activities, are associated with a delay in transitioning into sexual activity, but that when more religious young people do become sexually active they are less likely to use contraception (Manlove et al., 2006; Rostosky et al., 2004). Therefore, it is possible that a greater delay in sexual debut among more religious young people means that they are more likely to answer positively to the psycho-social components (given the demonstrated association between age at first sex, and willingness, autonomy, and perception of timing – shown in Chapter 7), while they are also less likely to have used contraception; thereby attenuating the correlation observed between contraceptive protection and the other components of sexual competence.

Based on the CFA models, for each participant a factor score was calculated based on his or her original responses to the four manifest items, with weightings applied according to the magnitude of the factor loadings estimated by the model. The histograms of these scores show that from a practical viewpoint, there is not enough variation in the four binary variables to make a range of factor scores that can be used as a meaningful continuous variable. On the application of a range of transformations to the factor scores, a normal distribution could not be achieved. In each of the three histograms of the pooled and gender-specific CFA models, there is an obvious 'threshold' in the scores which is suggestive of a natural cut-off point – on further inspection it was found that all the respondents with a factor score at this threshold are those in the sample that endorse all manifest four variables positively, while participants scoring below the cut-off are those who endorsed less than all four of the items. Based on these results, it seems reasonable to continue using the sexual competence as a dichotomous measure as originally coded in Natsal-3.

The results of this chapter also have relevance for the internal consistency of the measure of sexual competence. As described in Chapter 3, internal consistency is a type of reliability concerned with homogeneity of the items within a scale, i.e. the extent to which the items correlate with one another and therefore, are measuring the same underlying construct (DeVellis, 2003). The Cronbach alpha is the most commonly used measure of internal consistency, despite widespread criticism in the methodological literature due to its reliance on assumptions that are rarely met (Green and Yang, 2009; Huysamen, 2006; Sijtsma, 2009). The Cronbach alpha of the sexual competence measure was 0.47 – which is below the 'acceptable' cut-off value of 0.7. Cronbach's alpha relies on the assumption of 'tau equivalence' – that the individual items measure the same latent variables on the same scale, with the same degree of precision. However, when the factor loadings of the measurement model are dissimilar, as observed in the CFA model above, the assumption of tau-equivalence is violated, which is known to cause a substantial under-estimation of the reliability coefficient (Raykov, 1997; Graham, 2006).

An alternative to the Cronbach alpha is the Omega reliability coefficient (McDonald, 1999), which relaxes the assumption of tau equivalence (Dunn et al., 2013; Peters, 2014; Graham, 2006). The omega coefficient of the sexual competence measure was 0.66 – suggesting a greater degree of internal consistency than the Alpha. In evaluating the internal consistency of a measure, Peters (2014) suggests considering a range of diagnostics, including the correlations between the individual items, the factor analysis model, and the appropriate reliability coefficient. In the context of this study, there are statistically significant correlations between each of the items, the CFA model with a single latent factor fits the data well with all four factors

loadings of a salient magnitude, and the Omega coefficient is approaching 0.7. Therefore, the measure of sexual competence seems to have an acceptable, but not particularly high level of internal consistency. Psychometricians have argued that high reliability in the form of internal consistency can actually be a challenge to validity, in that high internal consistency is often achieved at the expense of content validity. In selecting a set of items due to their high degree of internal consistency, there is a risk that these items will not tap into all dimensions of the construct, resulting in an instrument that is an inadequate measure of the construct it aims to assess (Cronbach and Meehl, 1955; Kline, 1986). For example, the relatively lower factors loading of the contraceptive use item might indicate that this variable reduces the measure's internal consistency, however, given that the concept of sexual competence aims to cover the aspects of sexual health as defined by the WHO, the protection of physical health through contraceptive use is essential. Streiner and Norman argue that it is better to sacrifice internal consistency for content validity, rather than the other way around, as "the ultimate aim of the scale is inferential, which depends more on content validity than internal consistency" (Streiner and Norman, 1995) (p.147).

Limitations

While it may not seem realistic to operationalise a measure of a human behaviour/experience as a dichotomous construct, from a practical statistical standpoint, there is simply not enough variation in four binary variables to produce a meaningful range of continuous factor scores. If the measure had been made of a wider range of items – particularly given the rather crude nature of the questions measuring lower-level each concept, the CFA models may have resulted in a wider range of factor scores forming a more meaningful and useful continuous variable. A variable representative of a continuum would arguably be more realistic for measuring a human behavioural trait. The current measure defining an individual as either being sexual competent or not is likely to fail to represent the diversity of human experiences of first sexual intercourse.

The current analyses can only be considered to represent the properties of the sexual competence measure for first heterosexual intercourse. Vaginal intercourse is not the only form of sexual initiation, particularly for sexual minority youth. Research has shown that the 'first time' is an important experience for young people, regardless of sexual identity (Carpenter, 2001) – however, the current measure is limited in that it only applies to a specific type of sexual activity which occurs between a man and a woman. It is conceivable that a measure of 'sexual competence' for the first sexual experiences of gay and lesbian youths may be quite distinct.

The Natsal-3 survey included no questions regarding the enjoyment or pleasure conferred from the first sexual intercourse, and so no measure of this aspect of the experience is included in the

current measure of 'sexual competence'. This may pose a threat to the measure's content validity; the existing measure was designed with reference to the WHO-endorsed definition of sexual health, which emphasises the social and emotional aspects of sexual health as well as the avoidance of disease and unintended pregnancy – however the WHO definition also includes the 'possibility of pleasure', while additional definitions of sexual health also highlight the importance of 'pleasure' and/or 'enjoyment' (Edwards and Coleman, 2004). Whether enjoyment is a missing component of the measure of 'sexual competence' is explored using data from the Avon Longitudinal Study of Parents and Children (ALSPAC) in the Section 3 of the current chapter.

The original Natsal-3 coding specifies that for a respondent to be classified as 'sexually competent' at first sex, they must have reported the use of a reliable method of contraception in the form of the pill or condoms, along with endorsing each of the psychosocial variables positively. As described in Chapter 4, respondents could choose the answer option of having used 'other' contraception, and it is possible that those endorsing this option may have used a reliable method in the form of Long Acting Reversible Contraception (LARC), but will have been coded as using a non-reliable method. However, only 17 respondents reported using only 'other' contraception and therefore, this is unlikely to impact on the results of the statistical analysis.

6.1.5 Conclusions and Implications

This section presents the first empirical evaluation of the measure of 'sexual competence' at sexual debut, which has been measured in the second and third National Survey of Sexual Attitudes and Lifestyle and used in much of the resulting research literature (Wellings et al., 2001; Mercer et al., 2005; Wellings et al., 2013; Mitchell et al., 2013). Confirmatory factor analysis was employed to assess whether the hypothesised structure of the measure of sexual competence is consistent with the data. The results provide strong evidence in support of the hypothesised structure of the measure; each of the four items tap into a single common underlying latent factor, and are associated with this factor in the expected direction – the factor loadings estimated by the CFA models indicate that a higher score on the latent variable termed 'sexual competence' is associated with a significantly increased likelihood of having been equally willing at first sex, reporting that sex happened at the 'right time', for an autonomous reason, and using a reliable method of contraception.

Although the factors scores estimated by these measurement models do not exhibit enough variability to be used as a meaningful continuous latent index of sexual competence at first sex, the correspondence between the natural threshold observed in the histograms and the original

Natsal coding of the measure supports the use of sexual competence as a dichotomous variable based on those who endorse all four items positively and those who do not.

The measure of sexual competence at sexual debut aims to provide an assessment of the nature and appropriateness of the onset of sexual activity, based on the context and experience of the first sexual intercourse, rather than just the chronological age at which it occurred. The present section provides evidence for the construct validity of this measure. Further research, presented in the following chapters, is required to assess the measure's external-criterion validity – whether it is associated with other hypothetically-related factors.

6.2 SECTION 2: Latent Class Analysis of Sexual Competence Items

6.2.1 *Introduction*

The previous section used confirmatory factor analysis to assess whether the four items used to measure sexual competence tap into a single underlying construct as hypothesised. As discussed, CFA treats the underlying latent factor as a continuous variable. This section uses latent class analysis to explore whether meaningful groupings of participants, or meaningful categorisations of sexual competence, can be identified based on the responses to the four questions which comprise the measure of sexual competence. This analysis will provide insights into whether having just two categories of sexual competence, i.e. a respondent is either sexually competent or not at first sex, is supported by the data.

6.2.2 *Methods*

Latent class analysis is based on the same assumption as factor analysis: that there is an underlying latent variable(s) which determines the scores of a certain hypothesised set of manifest items (DeVellis, 2003).

Latent class analysis (LCA) can be used to reduce the complexity of a dataset by explaining the association between a set of manifest items in terms of respondents' membership to a smaller number of latent classes and so provides information regarding the interrelationships between the observed variables. In practice, LCA identifies distinct groups of cases or individuals within the population under study based on the participants' response patterns to a pre-determined set of variables; in this case, equal willingness, right time, autonomous reason, and contraceptive use, at sexual debut. For each individual in the dataset, a probability (estimated posterior probability) of belonging to each class is calculated based on their combination of responses to the manifest items. In contrast to the hypothesised continuous latent variable(s) underpinning factor analysis, in LCA there is assumed to be only a single latent variable which is categorical. The class membership of each individual indicates which category of the latent variable they fall into. For example, in a model with 3 latent classes, the latent variable can be defined to take the value '1' for an individual who is a member class 1, '2' for an individual in class 2 and so on (Bartholomew et al., 2008).

Using Mplus 7 (Muthén and Muthén, 1998-2012), LCA was conducted with the four binary variables described above (equal willingness, right time, autonomous reason, and use of reliable contraception, at first sex) using data from Natsal-3 respondents aged 16-24 at interview who had ever had heterosexual intercourse. Two distinct LCA models were specified, one with two latent classes and one with three latent classes. Analyses were conducted for men and women

as a pooled sample, and then separately by gender. The 'complex' command was used to account for the clustering, stratification and weighting of the survey data.

The degree to which the latent classes are clearly distinguishable by the data and the model, can be assessed by using the estimated posterior probabilities for each individual – the closer these probabilities are to zero or to one indicate clear classification of individual in to a certain class. The entropy measure provides a summary indicator of these probabilities - entropy values range from zero to one, where entropy values close to one indicate clear classifications (Muthén, 1998-2004).

By comparing the indices of fit for different models, the optimal number of classes for the data can be identified. Akaike Information Criteria (AIC) and Bayesian Information Criteria (BIC) are indicators of relative fit, whereby a decreased value suggests improvement of the model. For identifying the optimal number of classes to summarise a dataset, simulation studies suggest that the BIC is best indicator of fit (Yang, 2006; Nylund et al., 2007). Kass and Raftery (1995) advise that a difference between BIC values of greater than 10 provides very strong evidence against the model with the higher BIC value. The Lo-Mendell-Rubin (LMR) test is also appropriate for comparing LCA models with different numbers of classes; a significant LMR result indicates that the model with k classes is a better fit to the data compared with the simpler $k - 1$ class model (Finch and Bronk, 2011). Simulation studies have indicated that the LMR tends to overestimate the number of classes, therefore it is advised that once the p-value indicates a non-significant difference for the LMR (>0.05), this is a good indication to stop increasing the number of classes (Nylund et al., 2007).

6.2.3 Results

Latent Class Analysis: men and women pooled

Two Class Model

Table 10 shows the results of the two class LCA model for the female and male sample pooled. In specifying a two class model, the individuals in the sample are categorised into two classes, based on their patterns of endorsement for the four items under study. Table 10 presents for class 1 and class 2, the probability that a member of that class will endorse each item, for example, an individual who has been categorised into class 2 has a probability of 0.58 of having reported that they had first sexual intercourse at the 'right time', whereas a member of class 1 has a 0.94 probability of reporting that their first sexual intercourse happened at the 'right time'.

Table 10: LCA results (2 class model) showing probability that an individual in a given class with endorse each item. Men and women aged 16-24 at interview.

Observed Item	Class 1: 'sexually competent' (76.6%)	Class 2 (23.3%)
Right time	0.94	0.58
Autonomous reason	0.92	0.78
Equal willingness	0.93	0.65
Use of reliable contraception	0.84	0.10

Figure 20: Graph showing results of 2 class model (gender-pooled sample)

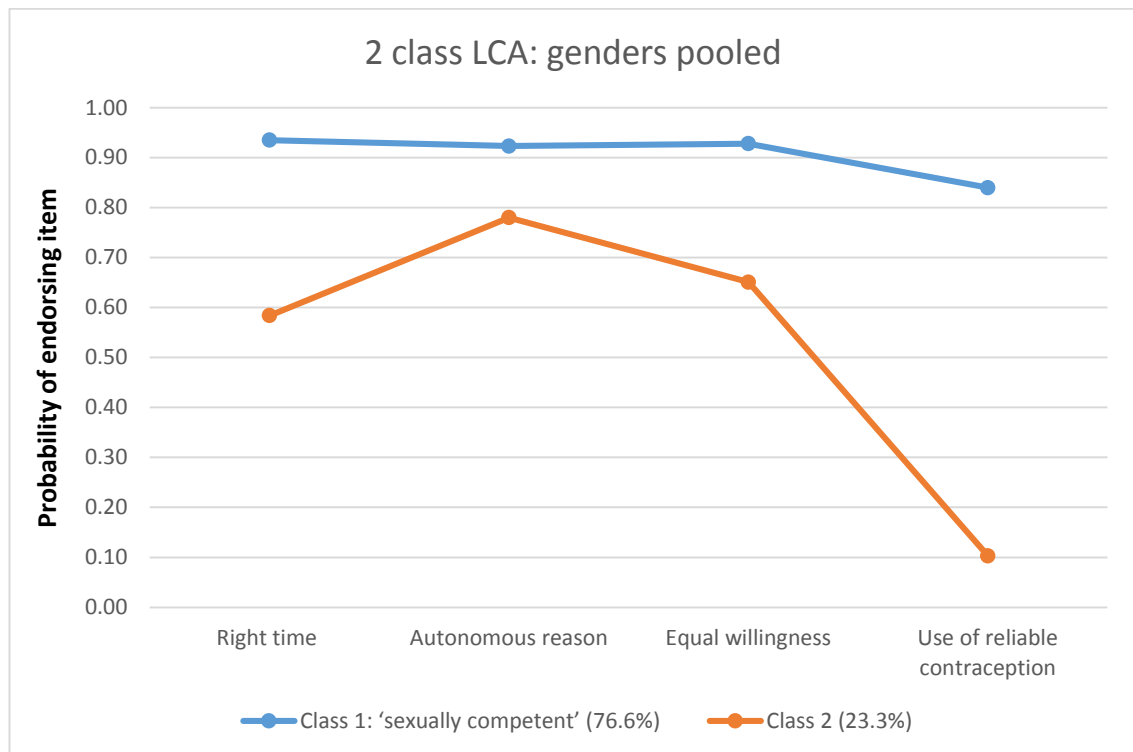


Figure 20 presents the results shown in Table 10 in graphical form. The points of the graph indicate the probability that a member of the given class will endorse the item labelled on the x-axis.

In this model we have specified that the latent variable of sexual competence is dichotomous, therefore identifying two distinct classes (or categories) of respondents. Class 1 contains 76.7% of the sample and is characterised by its members' high probability of endorsing each of the four items hypothesised to measure sexual competence, therefore, this class has been termed the 'sexually competent' group. The members of class 2, accounting for 23.3% of the sample, have relative lower probabilities of endorsing each item, and therefore seem to represent a less sexually competent group.

3 Class Model

Table 11 and Figure 21 show the results of the three class LCA. The three class model categorises 72.6% of respondents into class 1, the members of which are extremely likely (probabilities in excess of 0.83) to endorse each of the four items and so, this group has been termed the 'sexually competent' class. Class 2 contains 19.1% of the sample and is characterised by members who are moderately likely to endorse the three psycho-sexual variables: right time, autonomous reason, and equal willingness (probabilities ≥ 0.56), but who have not used a reliable method of contraception (probability=0). Class 3, accounting for 8.3% of the sample, contains individuals who are relatively highly likely to have used contraception, to have felt sex happened at the 'right time' and to have been equally willing, at first sex (probabilities ≥ 0.75), but have a low probability of endorsing autonomous reason (probability = 0.11).

Table 11: LCA results (3 class model), showing probability that an individual in a given class with endorse each item. Men and women aged 16-24 at interview.

Observed Item	Class 1: 'sexually competent' (72.6%)	Class 2 (19.1%)	Class 3 (8.3%)
Right time	0.93	0.56	0.83
Autonomous reason	1.00	0.81	0.11
Equal willingness	0.93	0.63	0.87
Use of reliable contraception	0.83	0.00	0.75

Figure 21: Graph showing results of 3 class model (gender-pooled sample)

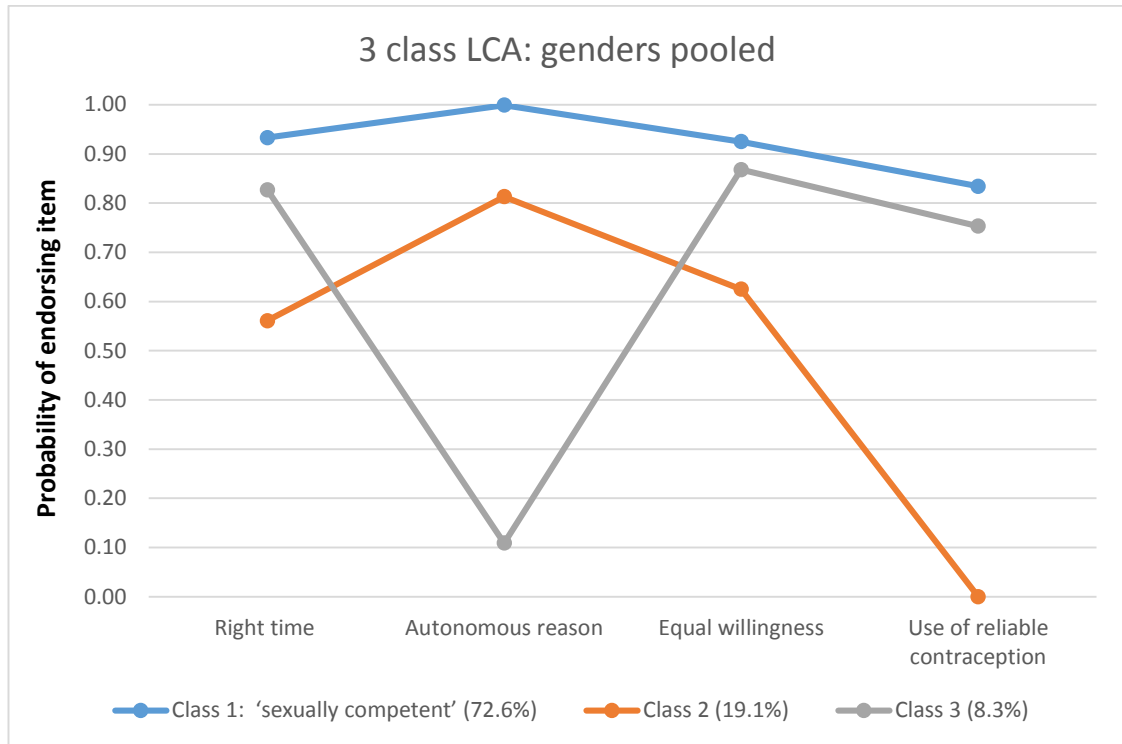


Table 12 shows the model fit indices for both the two class and three class LCA models. The difference in the BIC values between the 3 class and 2 class model is 19.67, providing very strong evidence against the 3 class model. The result of the LMR test ($p=0.1002$) also provides evidence that the 3 class model is not a significantly better fit to the data compared with the 2 class model. However, the entropy is higher for the three class model at 0.785, compared to the two class model which has entropy of 0.627. Therefore, the three class model provides slightly better classification of individuals into latent classes, however, the substantial increase in the BIC value and the non-significant LMR test indicates the 3 class model is a poorer fit to the data compared with the 2 class model.

Table 12: 2 class and 3 class model fit indices. Men and women aged 16-24 at interview.

Model	AIC	BIC	Adjusted BIC	LMR test p-value	No. Free parameters	Entropy
2 Classes	10307.635	10361.729	10333.132	<0.0001	9	0.627
3 Classes	10296.659	10380.804	10336.321	0.1002	14	0.785

Latent Class Analysis: Men

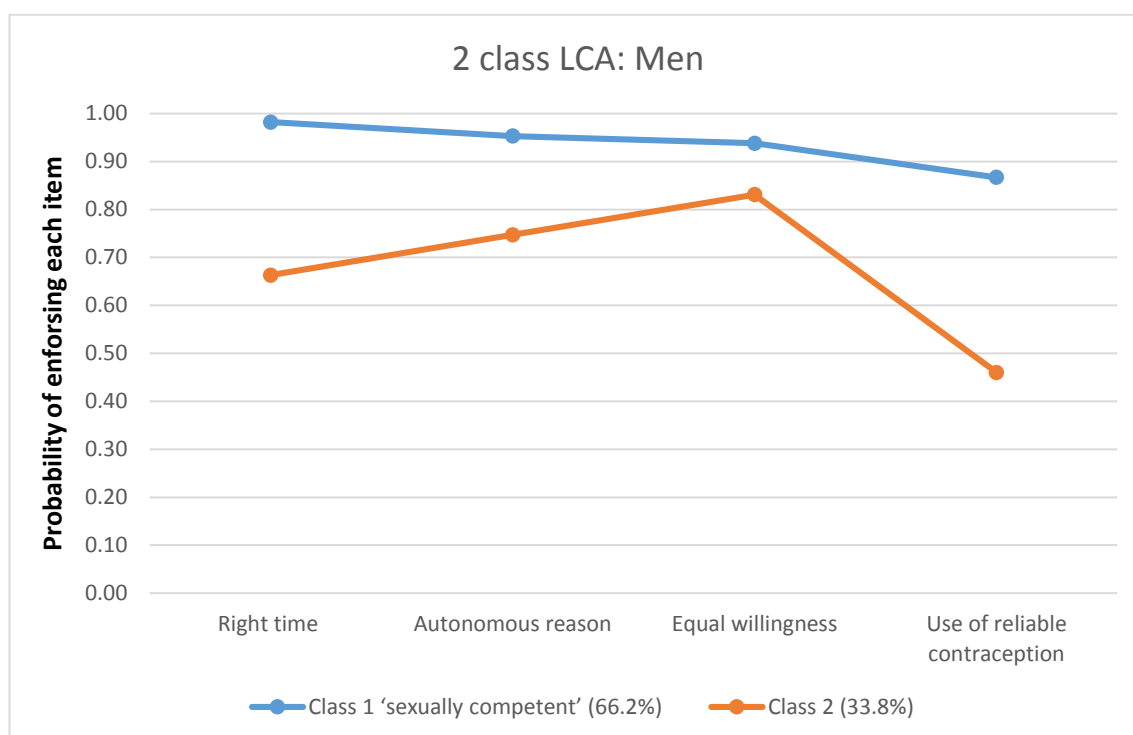
Two Class Model

Table 13: LCA results (2 class model) showing probability that an individual in a given class with endorse each item. Men aged 16-24 at interview.

Observed Item	Class 1 'sexually competent' (66.2%)	Class 2 (33.8%)
Right time	0.98	0.66
Autonomous reason	0.95	0.75
Equal willingness	0.94	0.83
Use of reliable contraception	0.87	0.46

Table 13 and Figure 22 show the results of the 2 class LCA of male respondents aged 16-24 at interview. The two distinct classes identified can be defined as those who are sexually competent (Class 1), members of which have probabilities greater than 0.86 of endorsing each of the four items, and those who are less sexually competent (Class 2) who have relatively lower probabilities of endorsing each of the items, though they still have a relatively high probability of reporting equal willingness, of 0.83. Of the male respondents aged 16-24 at interview, 66.2% are categorised into the sexually competent class and the remainder (33.8%) into the non-competent class.

Figure 22: Graph showing results of 2 class model. Men aged 16-24 at interview.



Three Class Model

Table 14: LCA results (3 class model) showing probability that an individual in a given class with endorse each item. Men aged 16-24 at interview.

Observed Item	Class 1: 'sexually competent' (81.5%)	Class 2 (7.8%)	Class 3 (10.7%)
Right time	0.93	0.40	0.79
Autonomous reason	1.00	0.88	0.00
Equal willingness	0.93	0.71	0.86
Use of reliable contraception	0.81	0.00	0.65

Figure 23: Graph showing results of 3 class model. Men aged 16-24 at interview.

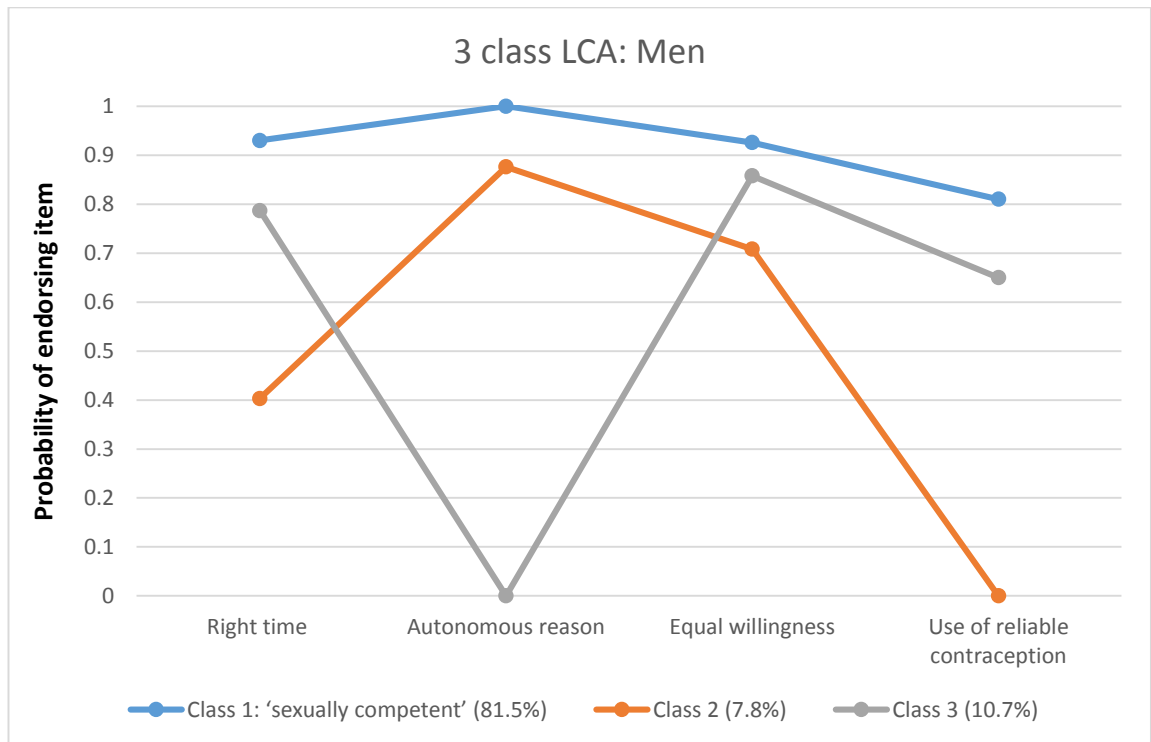


Table 14 and Figure 23 show the results of the three class LCA of men aged 16-24 at interview. Class 1, containing 81.5% of the sample, is easily definable as the sexually competent group, with members having high probabilities of endorsing each of the four items. Classes 2 and 3 seem to represent less sexually competent respondents, but with quite different combinations of endorsement probabilities for the four items. Members of class 2 (7.8% of the sample) have zero probability of having used a reliable method of contraception and a low probability (0.40) of reporting that first sex occurred at the right time, but higher likelihoods of endorsing equal willingness (0.71) and autonomous reason (0.88). Class 3, accounting for 10.7% of the sample, have zero probability of reporting an autonomous reason for first sex, but have relatively high probabilities of endorsing equal willingness (0.86), right time (0.79) and contraceptive use (0.65).

Table 15 presents the goodness of fit indices of the two class and three class LCA models for male respondents aged 16-24 at interview. The BIC value for the 2 class model is 24.71 points lower than the 3 class BIC, indicating better fit of the 2 class model. The non-significant LMR test p-value also supports that the 3 class model is not superior to the 2 class model. However, on increasing the number of latent classes, there is a substantial increase in entropy from 0.384 in the two class model to 0.892 in the 3 class model.

Table 15: 2 class and 3 class model fit indices. Men aged 16-24 at interview.

Model	AIC	BIC	Adjusted BIC	LMR test p-value	No. Free parameters	Entropy
2 Classes	4267.638	4314.367	4285.778	0.0001	9	0.384
3 Classes	4266.388	4339.079	4294.607	0.1006	14	0.892

Latent Class Analysis: Women

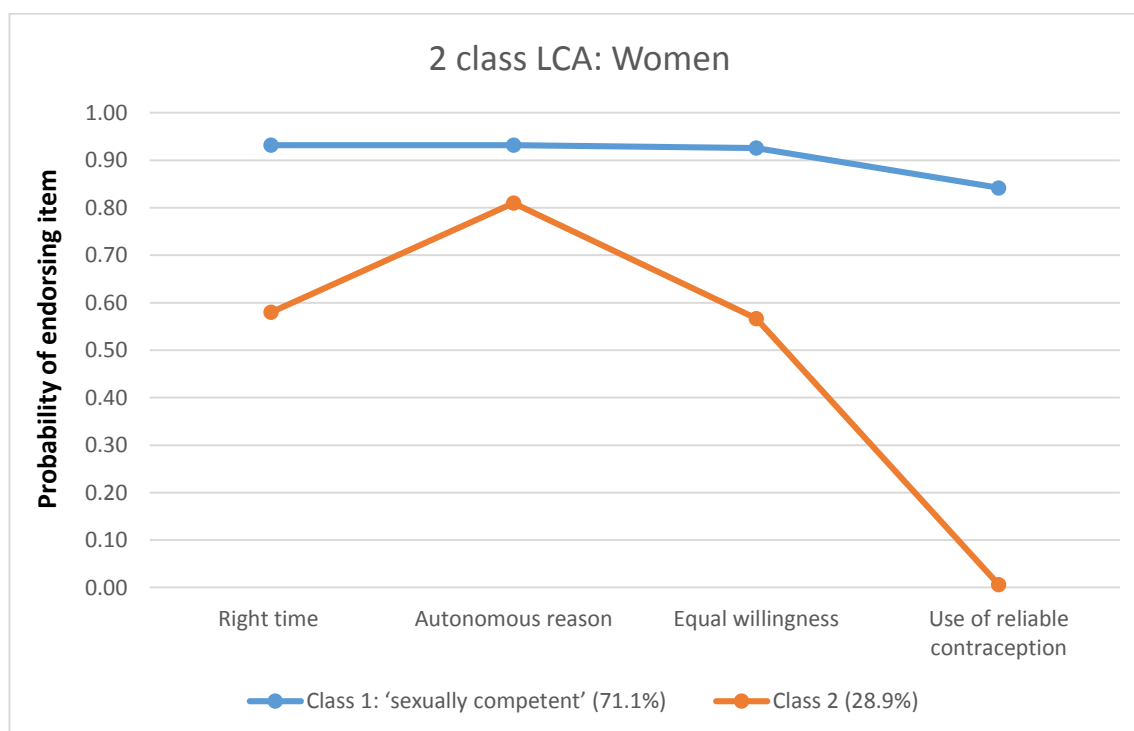
Two Class Model

Table 16 and Figure 24 show the results of the two class LCA of female respondents aged 16-24 at interview. Class 1 (71.1% of the sample) is identified as representing the sexually competent respondents, as members of this class have very high probabilities (in excess of 0.84) of endorsing each of the four competence items. Whereas members of class 2, accounting for 28.9% of the sample, have relatively lower probabilities of endorsing each item; they are particularly unlikely report contraceptive use (probability = 0.006), and also less likely to endorse 'equal willingness' (probability = 0.57) and 'right time' (probability = 0.58). Class 2 members' endorsement of 'autonomous reason' is closer to that of Class 1 individuals, with a probability of 0.81.

Table 16: LCA results (2 class model) showing probability that an individual in a given class with endorse each item. Women aged 16-24 at interview.

Observed Item	Class 1: 'sexually competent' (71.1%)	Class 2 (28.9%)
Right time	0.93	0.58
Autonomous reason	0.93	0.81
Equal willingness	0.93	0.57
Use of reliable contraception	0.84	0.01

Figure 24: Graph showing results of 2 class model. Women aged 16-24 at interview.



Three Class Model

Table 17 and Figure 25 show the results of the three class LCA for women aged 16-24 at interview. Class 1 is easily identified as the sexually competent group, with probabilities of endorsing each item in excess of 0.90, and containing 66.9% of the sample. Class 2 is a less competent group which accounts for 32.0% of the sample; its members' have consistently lower likelihoods of endorsing each of the items, compared to those in Class 1, with a particularly low probability of having used a reliable method of contraception (probability = 0.002). Class 3 is distinguished by its members' particularly low probabilities of endorsing each of the four items, ranging from 0.02 to 0.13, and therefore this class might be defined as a particularly non-competent group – however, this class only accounts for 1.1% of the sample under study.

Table 17: LCA results (3 class model) showing probability that an individual in a given class with endorse each item. Women aged 16-24 at interview.

Observed Item	Class 1: 'sexually competent' (66.9%)	Class 2 (32.0%)	Class 3 (1.1%)
Right time	0.93	0.65	0.03
Autonomous reason	0.93	0.85	0.02
Equal willingness	0.93	0.63	0.13
Use of reliable contraception	0.90	0.00	0.04

Figure 25: Graph showing results of 3 class model. Women aged 16-24 at interview.

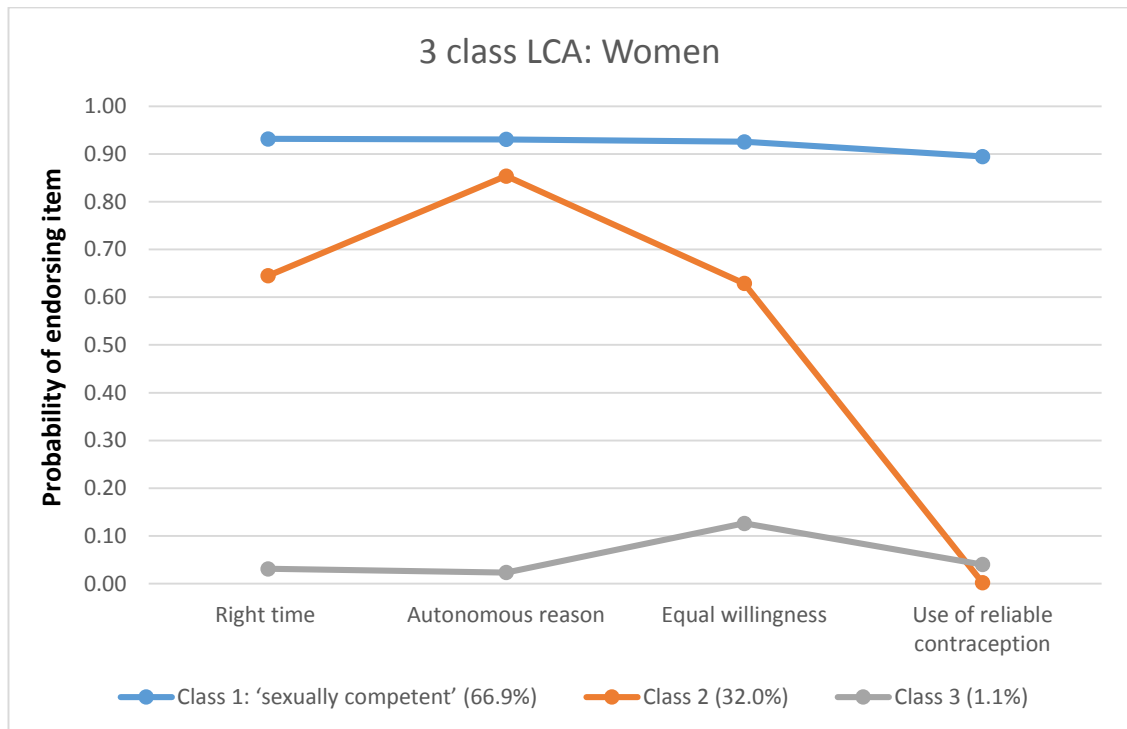


Table 18 presents the model fit indices of the 2 class and the 3 class LCA models for women aged 16-24 at interview. The difference between the BIC values for the 2 class and 3 class models is

29.61, indicating superior fit of the 2 class model. In agreement with the change in BIC values is the LMR test p-value of 0.2397, indicating that there is no evidence to suggest that the 3 class model is a better fit to the data compared with the 2 class model. With reference to the entropy, it seems that the 3 class model provides better classification of individuals compared with the 2 class model with the entropy increasing from 0.715 to 0.830.

Table 18: 2 class and 3 class model fit indices. Women aged 16-24 at interview.

Model	AIC	BIC	Adjusted BIC	LMR test p-value	No. Free parameters	Entropy
2 Classes	6012.554	6061.409	6032.817	<0.0001	9	0.715
3 Classes	6015.026	6091.023	6046.547	0.2397	14	0.830

6.2.4 Discussion

The analyses of the gender-pooled, male-only, and female-only samples all indicate that a 2 class model is of superior fit to the data compared with the 3 class model, as suggested by the substantial differences in BIC scores and the results of the LMR tests. The entropy values for each of the samples improve with the addition of the extra class, indicating the 3 class models provide clearer classification of individuals into latent classes. However, a certain degree of improvement in entropy is naturally expected to occur when an extra class is permitted, given that the greater the number of classes, the more likely that individuals can be better categorised into a given class. The rather substantial difference in entropy between the female-only and male-only 2 class models indicates that it is more difficult to clearly differentiate between the male respondents based on these four items – perhaps suggesting that these four items are not as sufficient for making meaningful distinctions between the experiences of first sex for men, as they are for women.

In all three samples, whether a 2-class or 3-class model, there is an obvious group which can be described as the sexually competent class. This class is distinguished by its members' very high probability of positively endorsing *each* of the items under study: equal willingness, autonomous reason, right time, and contraceptive use, at sexual debut – and therefore is similar in nature to the way in which the Natsal coding defines an individual as sexual competent which is based on the requirement that *each* positive condition of first sex must be endorsed.

In each of the two class models, the second class can be described as groups of individuals who were relatively less competent at first sex, given their lower probability of endorsing each of the items. The addition of a third class gave rise to another less competent class, but with the

exception of the female-only sample, no substantial difference in trajectory type (i.e. the shape of the graph) between the two non-competent classes within the 3 class models was observed – the extra class just seems to just provide a variation of the non-competent class identified in the 2 class model, so that no substantive meaningful distinction could be made between the two less competent groups. Conversely, in the female-only 3 class model, the third class does seem to represent a very different trajectory type compared with the first two classes, in that the members of this class have extremely low probabilities of endorsing any of the items and so, the classes seem to represent three distinct levels of high, moderate, and low sexual competence—however, this class accounts for only 1.1% of the sample, thereby limiting its further utility.

As noted above, factor analysis and latent class analysis are both based on the same assumption that there is an underlying latent variable(s) which determines the scores of a certain hypothesised set of manifest items. Factor analysis assumes that the latent variable(s) is of a continuous nature, whereas latent class analysis is based on the idea that there is a single categorical latent variable, with the appropriate number of categories determined by a comparison of models with different numbers of classes.

The consideration of whether the proposed latent variable of ‘sexual competence’ should be treated as a continuous or categorical trait should be informed by data and substantive theory. The original coding of the Natsal sexual competence measure results in a binary variable: respondents are either categorised as sexually competent or not sexually competent at first sex. In observing the distributions of the factor scores from the CFA (Section 1 of current chapter) there are obvious thresholds, which on further inspection, seem to be the same differentiation between groups that the original Natsal coding relies on: those who score positively on each item are classified as sexually competent, while those who score negatively on at least one item are deemed to be not sexually competent.

The two distinct classes identified by the two class LCA models are conceptually similar to those distinguished by both the original coding and the threshold cut-off observed in the CFA factor scores, in that one class, the sexually competent group, have a very high probability of scoring positively on each of the four items and the other class, termed the less sexually competent group, are relatively less likely to endorse each item. However, in the terms of the classification of Natsal respondents, while the Natsal coding finds around half of the respondents to be sexually competent at sexual debut, the corresponding competent proportion based on the 2 class LCA models varies between 66.2-76.7%; meaning that the LCA categorisation is more discriminatory and those deemed non-competent are effectively *more* non-competent than those identified by the Natsal coding.

From a theoretical viewpoint, it is difficult to conceptualise a human behavioural/psychological trait, such as sexual competence, as a binary characteristic which individuals either do or do not possess. However, in considering each of the observed variables hypothesised to be indicative of sexual competence, it seems reasonable that the endorsement of each is important for the sexual debut to be considered a positive and healthy experience. The proposed construct of 'sexual competence' can be considered in accordance with the definition of sexual health endorsed by the WHO which emphasises the importance of physical, emotional, mental and social well-being.

"Sexual health is a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled." (WHO, 2006)

This definition seems to rely on multiple factors, *all* of which should be fulfilled for sexual health, as opposed to any either/or or hierarchical relationships of the different typologies of health that are necessary to be sexually healthy.

6.2.5 Conclusions

By conducting latent class analysis of the four items hypothesised to be indicative of sexual competence, data-driven distinct groups can be identified and meaningfully categorised as differing levels of sexual competence. In considering the indices of relative fit, the 2 class models claim superiority above the 3 class models, providing evidence for the current dichotomous nature of the sexual competence measure. By examining the different classes' members' probabilities of endorsing each of the four items under study, one can identify that the two classes represent differing levels of 'sexual competence': those who were sexually competent at first sex and those who were relatively less so. The properties of these two groups are in accordance with the original Natsal coding of the sexual competence measure, though the proportion of respondents categorised as sexual competent at sexual debut by the LCA is greater than that classified by the Natsal coding.

This study provides evidence for the existence of two distinct groups of people based on their responses to these four items relating to sexual debut, and provides no evidence to suggest a greater number of meaningful categories of sexual competence exist based on these four variables.

6.3 SECTION 3: Should enjoyment be included in the measure of sexual competence at sexual debut?

6.3.1 Introduction

The WHO definition of sexual health refers to “the possibility of having a pleasurable...sexual experience” (WHO, 2006). No measure of pleasure or enjoyment is included in Wellings’ operationalisation of sexual competence. Pleasure is a complex concept to describe, let alone measure; pleasure may be conferred from physical stimulation or the emotional reaction to engaging in certain behaviours. At the beginning of new sexual relationships and particularly first ever sex, the encounter may be emotionally desired, yet not strictly physically pleasurable, but still judged as a positive experience overall (Hirst, 2008). Since the WHO states “the *possibility* of pleasure”, one could argue that being sexually competent is likely to increase the probability of conferring pleasure from the sexual experience; a sexual encounter that is wanted and protected is likely to be a more enjoyable experience than one that does not meet these criteria.

The absence of pleasure and enjoyment within sexual and reproductive health research and education has been noted and criticised over the years (Dixon-Mueller, 1993; Higgins and Hirsch, 2007; Philpott et al., 2006; Fine, 1988). Moreover, the word ‘pleasure’ and the concept of pleasurable sex are almost completely absent from UK sexual health policy discourse (Evans, 2006; Wellings and Johnson, 2013). However, the importance of pleasure in sexuality status is indicated by its inclusion in multiple descriptions of what constitutes sexual health. Edwards and Coleman (2004) reviewed eight definitions, three of which specifically include the mention of ‘enjoy[ment]’ or ‘pleasure’ (including the WHO definition), and a further two refer to ‘sexual fulfilment’, as a components of sexual health. In recent years a body of literature has emerged proposing that the inclusion of topics relating to achieving pleasurable sexual activity may help to improve the effectiveness of sexual education and interventions (deFur, 2012; Allen and Carmody, 2012; Beasley, 2008; Hirst, 2012). Hirst (2012) argues that the inclusion of enjoyment in sexual and relationship education in a way that asserts pleasure as a right for both partners may enable young people to feel “vindicated in declining pressure to take part in sexual acts or related activities they are not comfortable with, might not enjoy, regret or evoke anxiety” (p.430).

The Natsal surveys do not ask respondents about enjoyment or pleasure derived from their first experience of sexual intercourse – and so, there is no way to evaluate whether enjoyment might be a potential additional component to the current measure of sexual competence at first sex. However, the Avon Longitudinal Study of Parents and Children (ALSPAC) study does include a

measure of enjoyment in its 'romantic relations' questionnaire that was asked to a subset of the wider sample at age 15.5. This allows for an extension of analyses to establish the degree to which pleasure is correlated with the other components of sexual competence, and whether it taps into the latent construct of sexual competence, using factor analysis. The data and the questions employed in this analysis are not identical to those combined to make the sexual competence measure in Natsal-3, but are the only dataset that allows any kind of exploration of how enjoyment relates to the other items used to derive a measure of sexual competence.

Using data from ALSPAC, these analyses aim to:

- Assess the extent to which enjoyment correlates with each component making up the measure of sexual competence.
- Assess the evidence for whether 'enjoyment' taps into the same underlying latent variable, termed sexual competence, using CFA.

6.3.2 Methods

Participants and measures

The Avon Longitudinal Study of Parents and Children (ALSPAC) recruited 14,541 pregnant women resident in Avon, UK with estimated dates of delivery between April 1991 and December 1992. These women, the children arising from the index pregnancy and the women's partners have been followed-up since then and detailed data collected throughout childhood. When compared with the 1991 National Census Data, the ALSPAC sample was broadly similar to the whole population of the UK. The main differences are that the ALSPAC sample has a slightly higher proportion of married or cohabiting mothers, and a slightly smaller proportion of women from ethnic minorities (ALSPAC, 2008). The ALSPAC cohort is the only British longitudinal cohort following contemporary participants who are now in their early twenties.

Data have been collected through the use of survey-style questionnaires, and for certain topics, sub-samples (children from approximately 7000 families) of the cohort attended 'clinics' in which face-to-face interviews were carried out. During the clinic held when the young people were aged 15.5 years, data on sexual experiences was collected using computer-assisted interviews, following a protocol based on the Adolescent Sexual Activity Index (Hansen et al., 1999), in which participants are asked whether they have engaged in an increasingly intimate series of behaviours. The questions about sexual intercourse were only presented to participants who had responded positively to the prior questions about fondling private parts (of the 5241 respondents who started the romantic relations questionnaire, 907 reported having

heterosexual intercourse in last year). Unfortunately, the same line of questioning was not used at the 'clinic' when respondents were aged 17+, so that these data are available only for those who had sexual intercourse prior to the 15.5 year clinic.

Although the conceptual components of sexual competence measured in ALSPAC are the same as in Natsal-3 (contraceptive use, autonomous reason, willingness and timing), the questions are worded differently and/or have different answer categories (Figure 26). The specific differences are discussed in Chapter 2 (Section 8), though of particular note, is that the question relating to timing of first intercourse is especially different, with the ALSPAC question asking specifically about 'regret'. Moreover, while the Natsal items used to construct the measure of sexual competence refer specifically to the participants' sexual debut, the ALSPAC line of questioning begins with "In the last year have you had sexual intercourse with another teenager/young person?" with following questions then referring to the event sexual intercourse as "this" or "it". A subsequent question asks "Was this the first time you've had sexual intercourse?". At the 15.5 years clinic 53.5% of the sexually active respondents report to be referring to their sexual debut. This information enables the identification of two sub-samples: 1) those who are sexually active and whose responses to the romantic relations questionnaire refer to their sexual debut (n=484) and 2) those who are sexually active and whose responses refer to a sexual encounter that was not their sexual debut (n=420). In order to retain sample sizes large enough to conduct gender-specific investigations, the analyses include all respondents who had ever had sex in the year prior to the 15.5 clinic, regardless of whether the specific occasion they are referring to was their first time, or some subsequent sexual encounter.

In order to make four binary variables, choices had to be made about how to code the ALSPAC data, for example, whether the separate questions relating to alcohol and drugs should be included in the measure of autonomy. The decisions were made based on what seemed most conceptually similar to the Natsal coding, and by comparing the proportion who endorsed each condition in Natsal-3 (among those 15 or 16 at first sex) and ALSPAC using the alternative coding strategies (details in Appendix 4).

Figure 26: ALSPAC and Natsal-3 questions about experience of sexual intercourse (highlighted – answers classified as ‘sexually competent’)

Concept	NATSAL-2010 Questions	ALSPAC Questions
Willingness of partners	<p>Q: Would you say you were both equally willing to have intercourse that first time, or was one of you more willing than the other?</p> <p>A:</p> <ol style="list-style-type: none"> Both equally willing Respondent more willing Partner more willing 	<p>Q: Did you both know this [sexual intercourse] was going to happen?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No <p>Q: Did you want to do it?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No <p>Q: Did they make you do it?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No
Timing/Regret	<p>Q: Looking back now to the first time you had sexual intercourse, do you think....</p> <p>A:</p> <ol style="list-style-type: none"> You should have waited longer before having sex with anyone That you shouldn't have waited so long It was at about the right time 	<p>Q: How much do you regret having sex intercourse?</p> <p>A:</p> <ol style="list-style-type: none"> Not at all A bit Quite a lot Very much
Autonomous reason	<p>Q: Which one of these applied to you at the time.... (choose the main one that applied at the time)</p> <p>A:</p> <ol style="list-style-type: none"> I was curious about what it would be like I was carried away by my feelings Most people in my age group seemed to be doing it It seemed like a natural 'follow on' in the relationship I was a bit drunk at the time I had smoked some cannabis I had taken some other drugs I wanted to lose my virginity I was in love Can't choose/more than one main factor 	<p>Q: Why did you have sexual intercourse?</p> <p>A:</p> <ol style="list-style-type: none"> We were going out together and it seemed natural I wanted to know what it was like I love this person My friends do it So they wouldn't dump me I got carried away I want to lose my virginity <p>Q: The last time you did this, had you been drinking alcohol before it happened?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No <p>Q: After drinking alcohol were you....</p> <p>A:</p> <ol style="list-style-type: none"> Not tipsy at all A bit tipsy Quite tipsy Very tipsy Drunk <p>Q: The last time you did this, had you been using drugs before it happened?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No
Use of reliable method of contraception	<p>Q: Thinking of that first time you had sexual intercourse, did you or your partner use any form of contraception or take any precautions that first time, or not?</p> <p>A:</p> <ol style="list-style-type: none"> Condom The pill Emergency contraception Other contraception (Partner) withdrew Made sure it was a safe period No precautions by me, don't know about partner No precautions by either of us 	<p>Q: Did you use a condom?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No <p>Q: Did you use any other type of contraceptive?</p> <p>A:</p> <ol style="list-style-type: none"> Yes No <p>Q: What other type of contraceptive did you use?</p> <p>A:</p> <ol style="list-style-type: none"> Withdrawal The pill The morning-after pill Something else

Confirmatory factor analysis (described in the previous chapter) was used to assess two measurement models – both specified that the four binary variables (willingness, timing, autonomy, and contraception) tapped into the single underlying latent variables termed ‘sexual competence’, but the second model had the additional binary variable of ‘enjoyment’ included. Also presented is the tetrachoric correlation coefficients between each of the five binary variables. All analyses were conducted separately for men and women.

6.3.3 Results

Table 19: Reported enjoyment of sexual intercourse by gender. Survey question: “How much did you enjoy having sexual intercourse?”

	Men (n=359)		Women (n=544)	
	Percent	95% CI	Percent	95% CI
Not at all	0.55	0.14, 2.21	0.91	0.38, 2.19
A bit	2.51	1.31, 4.75	4.41	2.97, 6.50
Quite a lot	7.52	5.20, 10.76	18.57	15.51, 22.07
Very much	89.42	85.77, 92.21	76.10	72.33, 79.51

Table 19 presents the proportion of sexually active ALSPAC respondents who endorsed each response option for the question asking about enjoyment of the sexual encounter. Significantly more men than women reported that they had ‘very much’ enjoyed their experience of sexual intercourse (89.4% versus 76.1%). Table 20 shows the proportion of sexually active ALSPAC respondents who responded positively to each condition that is used to construct the measure of ‘sexual competence’.

Table 20: Percentage reporting positive conditions of sexual intercourse (95% confidence intervals)

	Men %(95% CI)	Women %(95% CI)
Both willing	89.75 (86.16,92.49)	88.62 (85.67,91.03)
Timing/No regret	88.06 (84.3,91.03)	84.56 (81.27,87.36)
Autonomous reason	90.03 (86.5,92.72)	91.19 (99.50,93.30)
Reliable method of contraception	93.35 (90.26,95.51)	86.42 (83.27,89.06)
Very much enjoyed	89.42 (85.77,92.21)	76.10 (72.33,79.51)

Table 21 and Table 22 present the tetrachoric correlation coefficients between each of sexual competence items and the binary enjoyment variable. With reference to the four original

components of sexual competence, each correlated positively with one another, however, the coefficient did not reach statistical significance for the correlation between contraceptive use and 'regret' among women, or for the correlation between contraceptive use and autonomous reason among male respondents. The enjoyment variable correlated positively and significantly with each of the psychosexual variables, but not contraceptive use, among the male participants. Among women, enjoyment was not significantly correlated with contraceptive use or autonomous reason, but was positively correlated with willingness and regret.

Table 21: Tetrachoric correlation coefficients and associated p-values for correlations between the variables relating to sexual competence items and enjoyment among male ALSPAC respondents (n=359).

MEN		Both willing	Timing/no regret	Autonomous reason	Contraceptive use
Timing/no regret	<i>Correlation coefficient</i>	0.2839			
	<i>P-value</i>	0.0292			
Autonomous reason	<i>Correlation coefficient</i>	0.4972	0.3565		
	<i>P-value</i>	0.0001	0.0047		
Contraceptive use	<i>Correlation coefficient</i>	0.1539	0.2736	0.072	
	<i>P-value</i>	0.2973	0.0498	0.7195	
Enjoyment	<i>Correlation coefficient</i>	0.4667	0.5027	0.3934	0.0476
	<i>P-value</i>	0.0002	0.0001	0.0021	0.7323

Table 22: Tetrachoric correlation coefficients and associated p-values for correlations between the variables relating to sexual competence items and enjoyment among female ALSPAC respondents (n=544)

WOMEN		Both willing	Timing/no regret	Autonomous reason	Contraceptive use
Timing/no regret	<i>Correlation coefficient</i>	0.5272			
	<i>P-value</i>	0.0001			
Autonomous reason	<i>Correlation coefficient</i>	0.4235	0.3041		
	<i>P-value</i>	0.0001	0.003		
Contraceptive use	<i>Correlation coefficient</i>	0.2436	0.1094	0.3752	
	<i>P-value</i>	0.017	0.3022	0.0003	
Enjoyment	<i>Correlation coefficient</i>	0.3149	0.4820	0.1584	0.1257
	<i>P-value</i>	0.0006	0.0001	0.1113	0.1904

Figure 27: CFA model of male ALPAC respondents

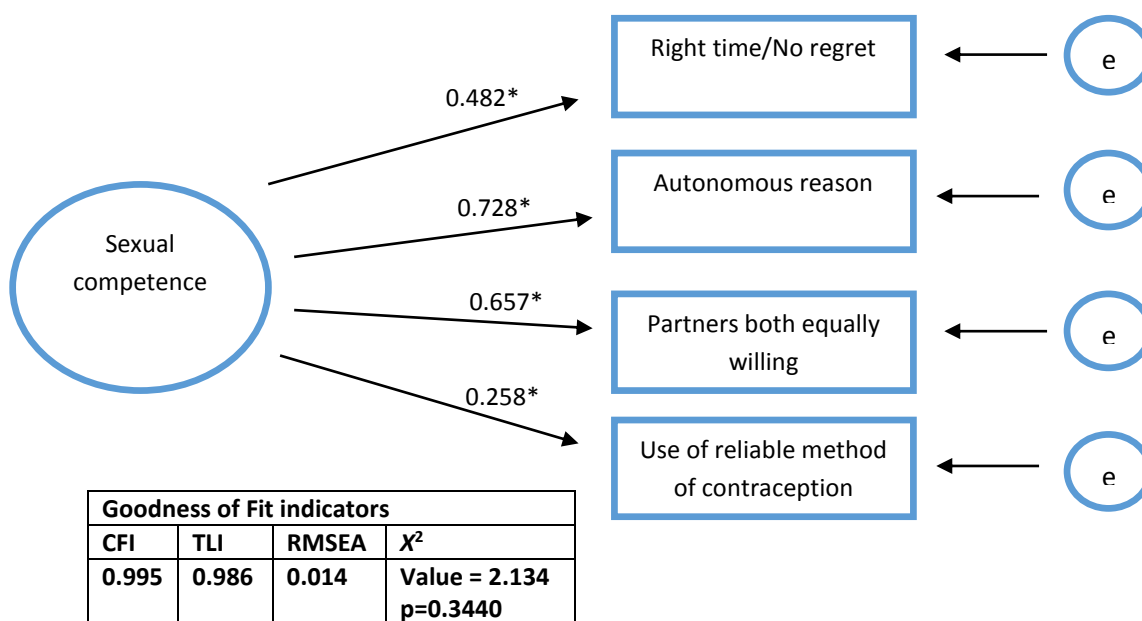


Figure 28: CFA model of female ALSPAC respondents

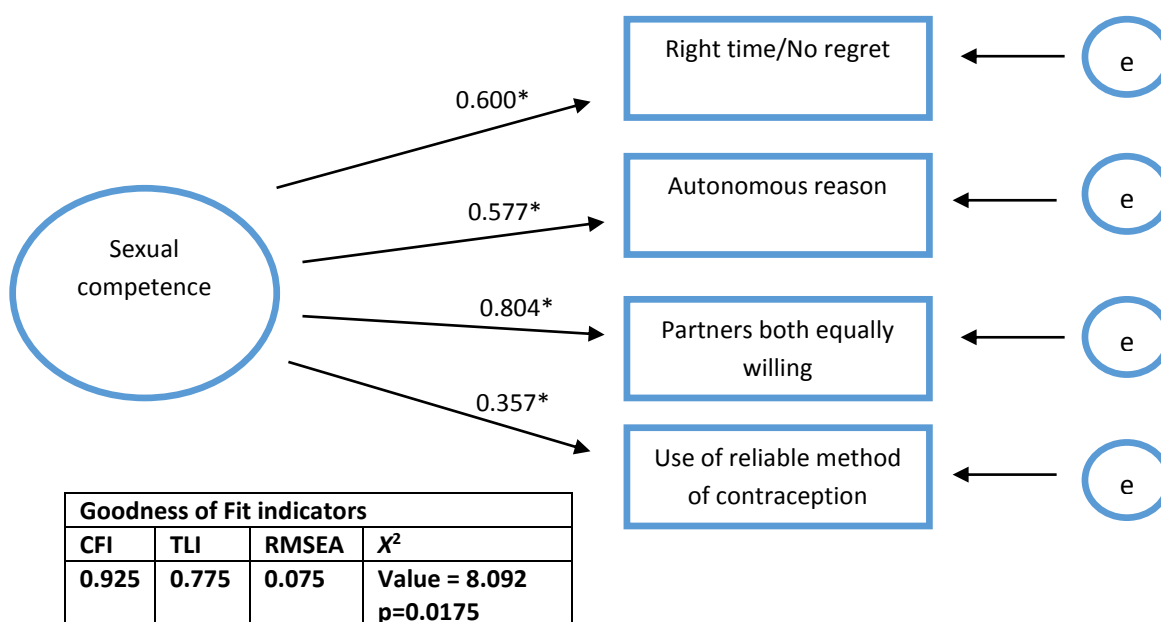


Figure 29: CFA model of male ALPAC respondents, with enjoyment variable

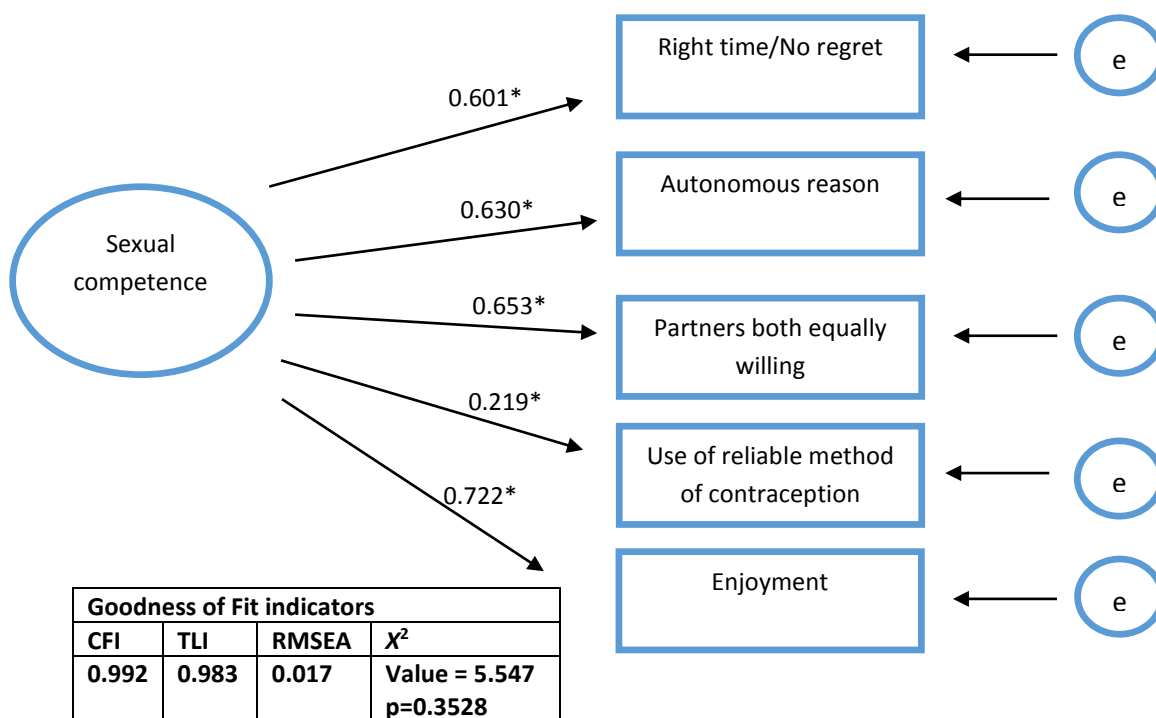


Figure 30: CFA model of female ALPAC respondents, with enjoyment variable

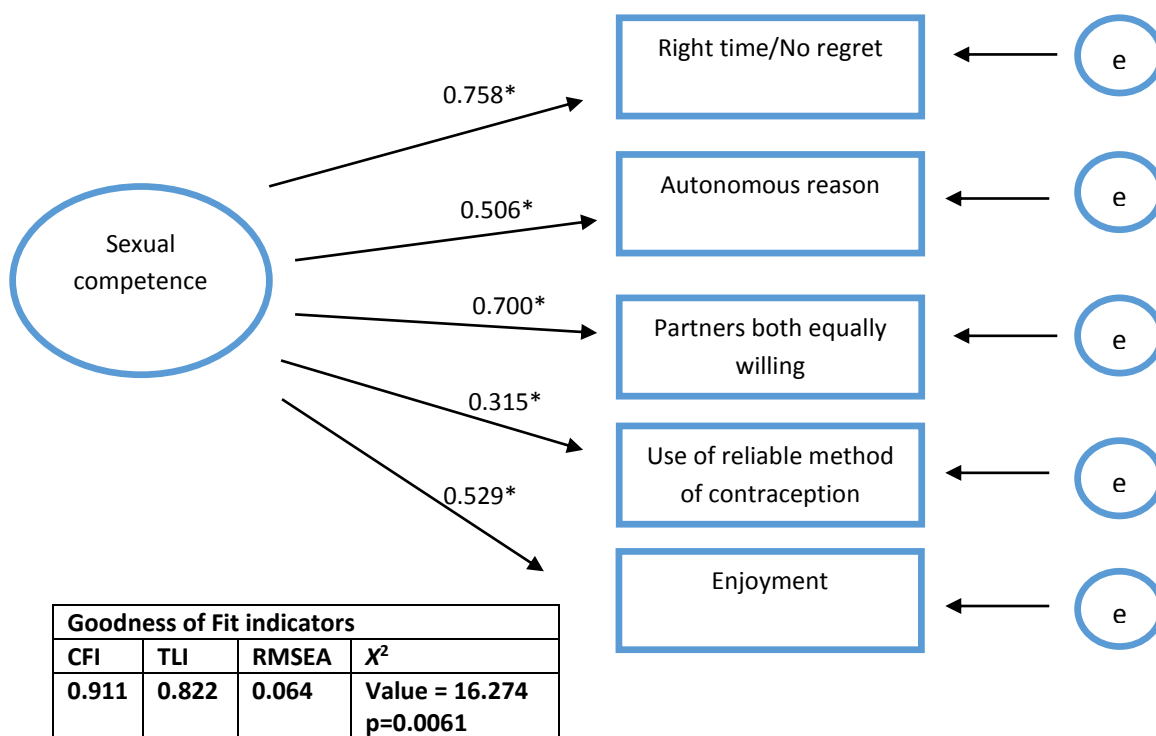


Figure 27 shows the results of the CFA model (without enjoyment) for male ALSPAC respondents. With the exception of contraceptive use, all the indicators have factors loading greater than the 0.3-0.4 threshold recommended for identifying salient relationships between the latent variable and the items tapping it (Brown, 2006). The fit indices all demonstrate very good fit to the data, with a CFI and TLI greater than 0.95, a RMSEA of less than 0.060, and a non-significant chi-squared p-value of 0.35 (Yu, 2002).

In the female-only CFA model (shown in Figure 28), the factors loadings indicating the strength of association between the latent variable and each item are all greater than 0.3. Compared with the male model, this CFA model does not demonstrate as good fit to the data, with a CFI of 0.925, TLI of 0.775, RMSEA of 0.075, and a chi-squared p-value of 0.018.

On adding the ‘enjoyment’ variable to the male CFA model (**Figure 29**), a good fit of the model to the data was retained, but not improved, as indicated by the CFI, TLI, RMSEA, and chi-squared test. The highest factor loading (0.722) observed in this model was that between the latent variable and the enjoyment variable, while the factor loading of the other three psychosexual variables were slightly lower at 0.60-0.65, and the loading of contraceptive use was just 0.219.

No substantial change in the goodness of fit indices was observed when the enjoyment variable was added to the female-only CFA model, shown in Figure 30, while the factor loadings were all greater than the 0.3 cut-off. The factor loading observed between the enjoyment item and the latent variable was smaller than that observed in the male model at 0.529.

Table 23: Threshold values from CFA models including enjoyment variable

ALSPAC	Thresholds	
	Men	Women
Willingness	-1.260	-1.210
No regret	-1.172	-1.021
Autonomous reason	-1.291	-1.356
Contraception	-1.510	-1.086
Enjoyment	-1.242	-0.714

The threshold parameter is the value of the latent variable at which an individual transitions from a value of 0 to 1 on the binary manifest variable (Brown, 2006). Table 23 presents the threshold values for the CFA models including the measure of enjoyment. Among men, when the value of the latent variable of sexual competence reaches -1.242, the individual will score 1 on the manifest binary variable relating to enjoyment, whereas among women, the threshold is relatively higher at -0.714. This suggests that men require a relatively lower level of ‘sexual competence’ to achieve ‘enjoyment’, compared with women.

6.3.4 Discussion

The correlation matrices indicate that significant associations exist between enjoyment and the other factors related to the context of first sex; a finding consistent with previous research. Higgins et al. (2010) reported that physiological satisfaction at first sex was highly associated with psychological satisfaction among men and women, while psychological sexual satisfaction was also associated with increasing level of commitment of relationship – with an association of greater magnitude among women compared with men.

The analyses shed light on gender differences in the role of enjoyment within the construct of sexual competence. The male-only CFA retained a good fit to the data when the ‘enjoyment’ variable was added to the model. Moreover, ‘enjoyment’ was the item with the highest factor loading (0.722), indicating that among men enjoyment was the most important function of this construction of sexual competence. For the women-only CFA, the poorer fitting model was not improved with the addition of enjoyment, and the variable had a factor loading of moderate magnitude (0.529). These findings are as expected given the gender-specific correlation coefficients observed between enjoyment and the other four items; with the exception of the enjoyment variable’s correlation with contraceptive use, the correlation coefficients between enjoyment and the remaining three psychosexual items were relatively larger among men than women.

These findings can be interpreted to suggest that enjoyment may be a more salient component of ‘sexual competence’ among men than women, indicated by the relatively higher factor loading and good model fit among the male sample. There may be a number, not necessarily mutually exclusive, explanations of these findings:

1) The gendered construction of sexuality

The gendered construction of sexuality emphasises the importance of the relational context for women and physical pleasure for men, meaning that the physical experience is a strong influence on how the encounter is evaluated by men – but there are other more important dimensions of the first sexual experience for women. Gender-specific sexual scripts dictate that women engage in sex with a person-centred script and men engage in sex with body-centred scripts. That is, women are more likely to have sex to strengthen relationships and increase intimacy, and men are likely to have sex to gain physical pleasure (DeLamater, 1986; Gagnon and Simon, 1973). Furthermore, a woman’s virginity is often perceived to be of greater value

than a man's, sometimes envisaged as a 'gift' for a deserving partner (Carpenter and Garcia, 2007) which should be reciprocated through love and commitment.

The prevalent gendered sexual scripts are reflected in the reasons men and women give for engaging in sexual intercourse. Ingham et al (1991) found that physical aspects, such as enjoyment and attraction were reported as a reason for having sex among men more than women. Similar findings are reported by Walsh et al. (2011), whose study of US university students showed that male respondents more commonly reported 'arousal' as a reason for engaging in sexual intercourse, while female participants were more likely to report their 'emotional connection' as a reason for having sex for the first time. Men in Ott et al's. (2006) study were also more likely to cite physical pleasure as a goal and expectation of sexual intercourse, while women more commonly reported intimacy. Young respondents of a study in Switzerland found similar differences in the values placed on different aspects of sexual relationships; with girls prioritising intimacy and fidelity, while boys attached more importance to physical pleasure (Narring et al., 2000). Holland et al. (2000) report marked sense of agency in the men's accounts of their sexual debut as a performance - however, women's accounts of first sex lacked notions of the act being about the woman's pleasure, performance or achievement of adult status and were more disembodied and distanced from the experience itself.

If the motivations and reasons for engaging in sex differ between genders – then it makes sense that the factors that are important for the wider evaluation of the sexual experience also differ according to how these reasons are prioritised among men and women. If young men prioritise the physical experience of the encounter more than women, then this may explain the gender differences observed in the strength of association (factor loading) between the enjoyment variable and the latent factor of sexual competence.

Previous research has also highlighted that little space is afforded to legitimise girls' rights to pleasure, and normative perceptions of the impermissibility of female pleasure work to encourage women's expectations of judgement and insult to reputation in response to their acknowledgement of sexual enjoyment. A female interviewee of Hirst's (2004) study stated: "How are you meant to admit ya like it? Teachers would think you're a slag" (p. 122). Martin (1996) also noted that women may emphasise the relational aspects in justifying her decision to have sex in order to avoid being castigated.

2) Differences in physical satisfaction

Physical satisfaction – particularly the achievement of orgasm – is less common among women, compared with men at first sex (Sprecher et al., 1995), possibly resulting in a less pleasurable experience for women. Perhaps the knowledge that this kind of pleasure is unlikely means that women focus on other aspects in their overall evaluation of the experience. While for men, not having an orgasm is rare – and so the influence that the level of physical pleasure has on the wider appraisal of the sexual experience is far more pronounced.

Physiological differences between men and women, combined with social norms that prioritise men's orgasm and vaginal intercourse (as opposed to other sexual activities which are often more effective for the female orgasm) contribute to women's lesser sexual satisfaction. Higgins et al., (2010) study of US university student found that only 25% women reported extreme or considerable physiological satisfaction at first vaginal intercourse, compared to 65% of men, and 38% of women reported extreme or considerable psychological satisfaction versus 57% of men. These findings mirrored the gender differences reported by Darling et al's (1992) analysis, which reported that 28% women experienced physiological satisfaction at sexual debut, while 28% women reported psychological satisfaction, compared with 81% and 67% of men respectively. Another cross-sectional study of 122 college men and women focusing on the affective reactions to first sex found that women were more likely to report feeling less pleasure, satisfaction and excitement than men, and more sadness, guilt, nervousness, tension, embarrassment and fear (Guggino and Ponzetti, 1997).

Sprecher et al's (1995) survey of 1600 US college students asked respondent to rate their first sexual intercourse on a pleasure scale ranging from 1 (not at all) to 7 (a great deal); women rated first intercourse as a 2.95 compared to men's 5.00 – this difference was found to be partially mediated by orgasm – no significant difference in pleasure reported by men and women was detected between men and women who experienced orgasm at first sex. This finding suggests that gender differences can at least be partially attributed to men being more likely to experience an orgasm during intercourse, compared with women. Rates of orgasm at first sexual intercourse have been reported to vary from 7-12% among women, compared with 76-84% among men (Sprecher et al., 1995; Tsui and Nicoladis, 2004; Sawyer and Smith, 1996). Women are also more likely to report experiencing pain during first intercourse (Tsui and Nicoladis, 2004)

The finding that men endorse the enjoyment item at a relatively lower level of 'sexual competence' compared to women may also be due to the physiological differences in men and

women's ability to achieve orgasm due to intercourse. It may also be a reflection of women's overall enjoyment being more to do with the wider context of the experience, as opposed to the more body-centred physical enjoyment that men are purportedly more likely to focus on.

Limitations

The main consideration to be noted when interpreting these analyses is their limited comparability to the Natsal-3 measure of sexual competence, which is the main focus of this thesis. The wording of the questions used in ALSPAC, particularly those aiming to measure 'willingness' and 'regret' are very different to those asked in Natsal-3, to the extent that it is questionable whether they tap into the same concepts. For example, the ALSPAC question asked explicitly about regret, whereas Natsal does not use this term, instead focusing on perceived timing. Moreover, the ALSPAC questions relate to an occasion of sex which occurred in the year prior to interview, as opposed to specifically first sex – this also limits comparability with the Natsal-3 measure which is specifically concerned with sexual debut. However, the ALSPAC was the only data source which provided the opportunity to assess the empirical relationship between enjoyment, and a version of 'sexual competence'.

The question asking about enjoyment makes no differentiation between emotional and physical enjoyment, and participants will likely have differed in the way that they interpreted and therefore answered the question. Our speculations about differences in the salience of physical enjoyment for men and women could have been further explored had such a distinction been made. Furthermore, participants were only asked specifically about enjoyment of the sexual intercourse but there may have been other non-coital sexual activities ('foreplay') which preceded intercourse that were also enjoyed, particularly for women who generally gain more physical pleasure from non-penetrative activities.

Due to the nature of the data collection, only those who had sex before the 15.5 clinic comprised of the sample used in this analysis – this means that our findings are only relevant to those who have had started having sex at a relatively young age. The gender differences in the role of enjoyment found in this study could be due to younger age of the sexually active respondents – in a study of US university students, Walsh et al. (2011) reported that gender differences in the reasons for and experiences of first intercourse become less pronounced when first intercourse occurred at older ages.

6.3.5 *Conclusions and Implications*

The findings above must be interpreted with caution given the limitations of the ALPSAC data noted above, however, the results suggest that enjoyment may be an additional component of sexual competence which is of particular salience for men.

At the same time, it needs to be borne in mind that inclusion of enjoyment as a criterion of sexual competence may make the concept less acceptable to policy makers and those providing SRE, because of possible sensitivities surrounding the idea of promoting sexual pleasure among adolescents. There is also the consideration that young people already have their own anxieties and external pressures dictating what sexual intercourse should be like – in suggesting that enjoyment is an essential condition for a healthy and positive sexual encounter may only serve to increase the pressure on the expectations of young people. Given that the addition of the enjoyment variable did not actually *improve* the fit of the CFA model for either gender, it is possible that its lack of inclusion in the current operationalisation of sexual competence makes little difference to the performance of the measure.

6.4 Summary of Chapter 6

- CFA provides evidence that the four items (willingness, timing, autonomy, and contraceptive use) hypothesised to be indicative of 'sexual competence' at first sex do indeed tap into a single underlying common construct.
- LCA suggests that two meaningful distinct classes (or categories) of individuals can be identified using the four items relating to first sex (willingness, timing, autonomy, and contraceptive use). The 'sexually competent' class derived from the LCA is very similar in kind to that which results from the original Natsal-3 coding i.e. the sexually competent group is defined by its members' very high probability of positively endorsing *each* of the four items.
- CFA of ALSPAC data suggest that 'enjoyment' also taps in to the same single underlying construct as the other four items, but the salience of enjoyment as a component of 'sexual competence' may be greater for men than women.

7. Chapter 7: Antecedent factors associated with sexual competence at sexual debut

7.1 SECTION 1: Exploring antecedent factors associated with sexual competence at first intercourse using Natsal-3 data

7.1.1 Introduction

Background to 'sexual competence'

Adolescent sexual activity is often portrayed as another 'problem-behaviour' (Donovan and Jessor, 1985) presented alongside smoking, alcohol and drug-use as a cluster of behaviours regarded as causes for concern. This viewpoint assumes that sex among young people is inherently risky, however the 'problem' in this context is constructed due to the age and assumed immaturity of young people (Halpern, 2010). As a result of sexual activity among younger teenagers being represented as a problem in itself, a principal focus of many studies of sexual behaviour is the simple categorisation of whether the participants are 'sexually active' versus 'sexually inactive'.

Alongside this focus on whether young people are sexually active or not is the preoccupation with the timing of sexual debut. Chronological age at first sex has long been the focus of research concerned with sexual behaviour among young people and particular emphasis is given to whether first sex occurred before or after the age of 16 – the legal age of consent in many countries, including Britain (AVERT, 2011). However, young people are a heterogeneous group with varying individual characteristics and circumstances, so that it may be inappropriate to generalise about the acceptability and the nature of sexual activity simply according to age at sexual debut.

Although early sexual activity is associated with increased risk of STIs and unplanned pregnancy (Kaestle et al., 2005; Eberhart-Phillips et al., 2001; Kahn et al., 2002b), studies have shown that psycho-social factors relating to the experience of first intercourse, such as regret and emotional experience, are also associated with adverse sexual health outcomes (Else-Quest et al., 2005; Reissing et al., 2012; Smith and Shaffer, 2013).

The concept of 'sexual competence' at sexual debut represents an attempt at a more nuanced approach to timing, focussing on the contextual attributes of the event, rather than simply age at occurrence. This approach takes the view that sexual activity among young people is not

inherently negative or risky, and that a judgement of the appropriateness of sexual activity based solely on chronological age neglects the importance of contextual factors in defining the nature of a sexual encounter.

Sexual competence as a concept was most notably first operationalised by Wellings et al (2001) using self-reports of four variables relating to participants' sexual debut, measured in the second National Survey of Sexual Attitudes and Lifestyles (Natsal-2): contraceptive protection, autonomy of decision (not due to external influences such as alcohol or peer pressure), equal willingness of both partners and acceptable timing (that it happened at the 'right' time). In order to be classified as sexually competent at sexual debut, a participant must have positively endorsed each of these four items.

The use of these four domains in defining sexual competence is compatible with the definition of sexual health endorsed by the World Health Organisation (WHO, 2006), which stresses the importance of not only physical health, but also mental and social aspects, referring to a "positive and respectful approach to....sexual relationships" and "safe sexual experiences, free of coercion".

The purpose of this chapter

The current analysis serves a dual purpose:

1. to investigate whether the measure of sexual competence is associated with hypothetically related factors, such as age at sexual debut, so providing information on the measure's external-criterion validity.
2. to explore which antecedent factors are associated with sexual competence, how these differ between men and women, and their public health relevance.

External-criterion validity refers to the extent to which the measure correlates with a gold-standard measure of the construct (which does not exist for sexual competence) or, as used in this study, the extent to which it correlates with other theoretically-related items. For example, this analysis examines whether the measure of sexual competence differentiates between people of different ages at sexual debut. The measure's ability to predict hypothesised associated subsequent outcomes relating to sexual health is examined in Chapter 8.

The identification of antecedent factors associated with sexual competence is considered to be of public health relevance as sexual competence at sexual debut is arguably an important

outcome in itself. A first sexual experience that is characterised by equal willingness, an autonomous decision, acceptable timing, and the use of a reliable method of contraception can be seen to be more positive than an encounter that does not meet each of these conditions. Furthermore, given its compatibility with the WHO definition of sexual health, the concept of sexual competence is likely to identify a first sexual encounter that is consistent with wellbeing and health: physically, emotionally, and socially.

Given the novel nature of the concept of sexual competence, there is minimal prior research using this measure, and so this is an exploratory analysis. The conceptual framework informing the choice of explanatory variables examined in this study is broadly based on that developed by Vanwesenbeeck et al (1999) who aimed to provide an “integrated view of factors and processes in heterosexual competence and risk” (p.29). This framework recognises the need to study sexual risk behaviour with a developmental perspective and sees sexual behaviour, whether risky or not, as behaviour that is socially learned rather than innate. The authors present a framework which aims to cover the potential influences on sexual behaviour through life course, from socio-economic and family-related factors in childhood and adolescence, to sex and relationship education, and factors relating to the immediate context in which the sexual encounter occurs, including characteristics of the relationship and partners.

This approach allows consideration to be given beyond the individual level to incorporate the influence of the wider context and is in accordance with the current sexual health literature, including that relating more specifically to the experience of *first* intercourse, with countless studies finding a huge range of influences on sexual behaviour acting at the social, contextual, and individual level. Indicators of individual and familial socio-economic status (SES) have been associated with timing (Wellings et al., 2001) and condom use (Henderson et al., 2002) at first sex. Certain ethnic groups have been found to be less likely to use contraception at sexual debut (Coleman and Testa, 2007) and more likely to report pressure from their partner at first sex (Wight et al., 2008). Disrupted family structure has been found to be associated with earlier sexual debut (Wellings et al., 2001; Lenciauskiene and Zaborskis, 2008), and lower reported ‘wantedness’ of first sex (Abma et al., 1998). School as the main source of sex education has been associated with contraceptive use and later sexual debut (Wellings et al., 2001). With reference to the more immediate context of the sexual encounter, more casual partnerships have been found to be associated with pressure and regret of sexual debut (Wight et al., 2008). First sex occurring with a relatively older partner has been associated with lower ‘wantedness’ of sex (Abma et al., 1998), greater pressure from partner (Wight et al., 2008) and reduced condom use (Mercer et al., 2006), while having a partner who is also a virgin at first has been

shown to be associated with mutual willingness (Dickson et al., 1998). Therefore, based on this framework and the availability of variables in the dataset, the forthcoming analyses seek to assess the influence of range of factors on sexual competence at first sex.

7.1.2 Methods

Participants and measures

Data from the Third National Study of Sexual Attitudes and Lifestyles (Natsal-3) were analysed. Natsal-3 is a stratified probability sample survey of 15,162 men and women aged 16-74 and resident in Britain. Participants were interviewed in 2010 - 2012 using a combination of face-to-face interviews, computed-assisted personal interviews and computer-assisted self-interviews.

For the purpose of this research, analysis has been restricted to respondents aged 16-24 years at interview to ensure that the results are applicable to the contemporary young population of Britain – an age group of high policy relevance. Participants were asked about their age and experience of first sexual intercourse using show cards in the face-to-face component of the interview. Where respondents reported that they first had sexual intercourse at 12 years old or younger, the questions related to the circumstances and experience of first sex were asked about their first sexual intercourse since turning age 13. This was with the aim of avoiding probing questions about early sexual encounters which may have been non-consensual. The questions concerning the experience of first intercourse sought to measure whether partners were both equally willing to engage in sexual intercourse, whether the decision to have sex was autonomous (not due to factors external to the self, such as peer pressure or drunkenness), whether the respondent felt their first sexual encounter had happened at the 'right' time, and whether a reliable method of contraception had been used (contraceptive pill or condom). As in the study by Wellings et al. (2001), the measure of sexual competence was retrospectively constructed using the above four variables and respondents who endorsed fewer than all four of these items were categorised as not sexually competent at first sex.

Explanatory variables were selected based on their availability within the dataset, and as discussed previously, with the aim of representing key influences in childhood and adolescence, along with those relating to the more immediate context of first sex. Three indicators relating to socio-economic status were explored: the Index of Multiple Deprivation quintiles (adjusted to ensure comparability across England, Scotland and Wales using a method by Payne and Abel (2012)) - indicative of the local environment in which the respondent currently resides, parental social class – representing the status of the family unit in which the participant grew up, and finally, educational level of the participant – providing an indicator of the social position of the

respondent her/himself. The ethnicity of the participants, and their family structure at age 14, provide further cultural and contextual information on their developmental influences. Two variables relating to learning about sex, which potentially have a more direct influence on sexual behaviour, were examined – one based on participants' responses to a question asking what was their 'main' source of sex education; the other was based on reports of the level/difficulty of discussing sex with their parents during their teenage years. Finally, factors relating to the immediate context of the first experience of sexual intercourse were explored, including the nature of the relationship with that first sexual partner, the age of the respondent at sexual debut and how this compared to the age of the partner, and the prior sexual experience of the partner. Given the focus on 'early' sexual intercourse - usually defined as that which occurred before the age of 16 – age at first sex is operationalised as both an ordered categorical variable including a range of ages, and also a binary variable referring to whether sex occurred before or after the respondent turned 16.

Statistical Analysis

Descriptive statistics of the sample used in this study can be found in Chapter 5. The proportion of respondents who reported unequal willingness at first sex, a non-autonomous reason, that sex had not happened at the 'right time', and non-use of contraception at sexual debut, were calculated by age at sexual debut and gender.

Prevalence and unadjusted odds ratios were estimated to examine variation in the prevalence of sexual competence at sexual debut by socio-demographic characteristics, variables relating to learning about sex, and aspects of the relationship within which sexual debut occurred (described above).

Multivariable logistic regression was used to determine which factors were remained independently associated with sexual competence at sexual debut after adjustment for other variables. Explanatory variables were added to the regression models in four stages, and these multivariable regression models are presented for men and women separately; the first includes the variables relating to socio-economic and demographic background factors (model 1); in the second model the two variables relating to how the respondent learnt about sex are added to the regression (model 2); model 3 introduces the variable relating to age at sexual debut, and model 4 also includes the variables indicative of the context in which first sex occurred.

All analyses were restricted to respondents aged 16-24 at interview who had ever had heterosexual intercourse and carried out separately for men and women to allow for the identification of gender differences. Multivariable regression analyses were performed on

complete cases in order to ensure comparability of adjusted odds ratios across models. All statistical analyses were conducted using the Stata (Version 13) survey commands, which account for the weighting, clustering, and stratification of the survey data.

Results

Prevalence and unadjusted odds ratios

Table 24 shows the proportion of 16-24 year old respondents who reported: unequal willingness at first sex, a non-autonomous reason for engaging in sex, that sex had not happened at the 'right time', and non-use of contraception at first intercourse, by gender and age at first sex. A general pattern was observed whereby the younger the female respondents were at sexual debut, the more frequently they reported adverse contextual factors, such as partners not being equally willing, sex not having happened at the 'right time', and for a non-autonomous reason. For men, slightly less variation in these items according to age at sexual debut is observed, but still the overall pattern is the same as that of women. Contraceptive use also varied according to age; female and male respondents who were 13-14 at first sex were particularly unlikely to have used a reliable method of contraception, compared to those who were relatively older.

Among women, prevalence of non-competence at first sex was highest among those for whom sexual debut occurred at 13-14 years old (78%), falling to 59% among participants aged 15 at first intercourse and 44% for those aged 16 at the event. For men, a similar pattern was observed; the proportion of participants classified as not sexually competent at sexual debut decreased from 64% among those for whom the event occurred at age 13-14, to 49% for those aged 15, and to 33% among respondents aged 16 at the time. Only slight differences were observed between those aged 16, 17 or 18-24 at first sex, with the proportion not sexually competent ranging from 37-44% among women and 33-39% among men. Overall, the prevalence of sexual non-competence was significantly higher among women compared to men (51% versus 44%).

Table 25 shows the prevalence and unadjusted odds ratios of sexual non-competence at first intercourse according to socio-demographic characteristics, source of information about sex, ease discussing sexual matters with parents, and the attributes of the partnership within which first sex occurred. Among young women, all of the factors examined, with the exception of age at menarche and religion, were statistically significantly associated with sexual competence at first sex, with $p \leq 0.05$. Among the young men, all the factors apart from religion and those relating to learning about sex (main source of sex education and discussion about sex with parents), were significantly related to sexual competence at first sex.

Among men, the proportion who were not sexually competent at first sex increased with each IMD quintile – representing greater deprivation. For women, the association with the IMD

quintile only reached statistical significance when comparing the two most deprived quintiles with the least deprived. Similar differences in the proportions not sexual competent at first sex according to socio-economic position were indicated by the parental social class variable. Compared to respondents whose parents were non-manual workers, women and men whose parents were manual workers were more likely to have not been sexually competent at first sex. A similar association was observed between the 'no response' category of parental social class and sexual competence – previous analyses identified that this group are very similar to the manual parental social class group on measures of area of residence IMD and educational level. Among men and women, compared with those who left school at 17 or older, leaving school at 16 with qualifications or without qualifications was associated with an increased likelihood of not being sexually competent at first sex.

Family structure (parental living arrangements at 14) was also a significantly associated influence, with those who lived with both parents until age 14 being more likely to have been sexually competent at first sex, compared to those who lived with one or none of their parents. Women of black ethnicity were more likely than white women to be sexually non-competent at first sex, while among men, the significant difference was observed between men of white and mixed ethnicities.

Female respondents whose main source of sex education was their friends or an 'other' source were more likely to not be sexually competent at sexual debut, compared to those whose main source was school. Reporting that they had not discussed sex with their parents at age 14, or that they had but that the discussion was 'difficult', was associated with an increased risk of non-competence at first sex among women.

First intercourse before age 16 was significantly associated with sexual non-competence among men and women. With reference to the characteristics of the partner, the rate of sexual competence peaked among those who *knew* that it was also their partners' first time. Finally, respondents who reported being younger than their partner at first sex were more likely to be sexually non-competent at debut.

Out of all the explanatory variables examined, the relationship context in which first sex occurred was most strongly associated with sexual competence among both men and women. Compared to those who reported being in a 'steady relationship at sexual debut, those who had 'just' or 'recently' met, who had known each other for a while but were not in a relationship, or those who used to be in a steady relationship, were more likely to have been non-competent at

first sex, with prevalence of non-competence peaking among those who had 'just' or 'recently' met.

Table 24: Proportion of Natsal-3 respondents aged 16-24 reporting certain circumstances at first sex by age at sexual debut.

	Not equally willing		Not right time		Non autonomous reason		Did not use reliable contraception		Non competent		Denominator
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	Unweighted/Weighted
WOMEN											
13-14	26.87	21.53,32.98	71.65	65.60,77.01	28.97	23.60,35.00	17.21	13.06,22.34	77.59	71.64,82.60	270/129.81
15	14.60	11.32,18.63	51.83	46.43,57.19	22.05	17.89,26.86	9.09	6.60,12.39	58.88	53.42,64.12	398/207.15
16	15.45	11.93,19.76	30.23	25.83,35.03	13.66	10.66,17.34	6.92	4.95,9.60	44.05	39.18,49.03	500/272.43
17	17.87	12.43,25.01	31.44	25.18,38.45	14.29	10.25,19.56	10.86	7.15,16.15	47.62	40.70,54.64	262/152.09
18-24	13.36	9.00,19.37	22.08	16.25,29.26	7.66	4.38,13.05	11.3	7.51,16.66	36.30	29.26,43.98	227/162.72
All	16.90	14.94,19.06	39.65	37.07,42.29	16.86	14.99,18.91	10.27	8.76,12.01	51.31	48.63,53.98	1657/924.07
MEN											
13-14	16.65	11.45,23.58	49.00	41.81,56.23	14.25	9.54,20.76	22.67	17.38,29.01	63.81	56.72,70.35	238/166.87
15	8.07	5.28,12.16	31.46	26.00,37.49	16.46	12.47,21.42	11.27	8.01,15.63	48.63	42.49,54.81	303/210.72
16	6.25	3.84,10.01	19.34	14.63,25.14	11.17	7.92,15.53	5.39	3.40,8.45	32.75	27.25,38.77	348/251.22
17	13.12	7.63,21.63	15.62	10.73,22.18	7.86	4.72,12.81	9.53	6.13,14.54	38.04	30.70,45.97	214/159.62
18-24	7.36	4.57,11.63	22.95	16.79,30.54	12.36	8.25,18.09	12.77	8.59,18.58	39.56	32.30,47.30	217/180.11
All	9.76	7.92,11.97	27.12	24.44,29.98	12.52	10.61,14.72	11.7	9.98,13.67	43.69	40.60,46.84	1320/968.54
N (unweighted/weighted) ²	2997/1899.3		2971/1888.64		2957/1879.47		2985/1898		2977/1892.61		

Bolded: Significant test for trend

² N competent exceeds n of some of the components – respondents with missing data on any of the components were classified as non-competent if any of the non-missing values indicated unequal willingness, not right time, non-autonomous reason, or non-use of reliable contraception.

Table 25: Proportions and unadjusted odds ratios of Natsal-3 respondents aged 16-24 at interview who were not sexually competent at first sex, by gender and explanatory variables.

OUTCOME: SEXUAL NON-COMPETENCE	Men					Women					N(unweighted/ weighted)
	%	95% CI	Crude OR	95% CI	p- value	%	95% CI	Crude OR	95% CI	p- value	
IMD quintile											
1: least deprived	29.11	22.97,36.12	1			42.92	37.26,48.76	1			493/320.96
2	38.69	32.44,45.34	1.54	1.01,2.35	0.047	50.15	43.79,56.51	1.34	0.95,1.89	0.097	555/352.30
3	42.38	35.72,49.34	1.79	1.18,2.73	0.007	45.97	39.91,52.16	1.13	0.81,1.58	0.471	559/351.39
4	51.08	44.04,58.08	2.54	1.66,3.90	<0.001	56.51	50.94,61.92	1.73	1.25,2.39	0.001	636/437.50
5: most deprived	52.63	46.30,58.88	2.71	1.80,4.06	<0.001	57.51	52.07,62.78	1.80	1.30,2.49	<0.001	734/430.47
Parental SES											
No response	56.97	48.14,65.38	2.11	1.44,3.10	<0.001	57.09	48.55,65.24	1.46	1.01,2.10	0.041	316/192.05
Parents iv/v manual	53.88	46.52,61.08	1.87	1.34,2.59	<0.001	58.65	52.27,64.75	1.56	1.16,2.09	0.003	550/331.82
Parents i/ii/iii non-manual	38.51	34.93,42.22	1			47.69	44.47,50.93	1			2008/1315.17
Education level of respondent											
Left school at 16 with no qualifications	63.97	50.39,75.63	2.62	1.46,4.70	0.001	79.29	68.54,87.06	4.14	2.33,7.36	<0.001	157/ 85.09
Left school at 16 with qualifications	50.3	43.66,56.94	1.49	1.09,2.04	0.013	60.71	54.32,66.75	1.67	1.25,2.23	0.001	560/326.61
Left school at 17+	40.43	36.63,44.35	1			48.05	44.89,51.23	1			2061/1371.02
Currently 16	44.90	34.45,55.81	1.20	0.75,1.91	0.441	44.09	34.09,54.59	0.85	0.55,1.33	0.479	193/106.16
Ethnic Group											
White	42.59	39.38,45.86	1			49.79	47.05,52.54	1			2666/1666.29
Mixed	62.51	45.42,76.96	2.25	1.10,4.59	0.026	63.47	50.14,75.01	1.75	1.01,3.05	0.048	110/ 66.71
Asian	47.31	31.68,63.49	1.21	0.62,2.37	0.577	45.67	29.04,63.34	0.85	0.41,1.76	0.658	83/ 67.73
Black	45.29	28.10- 63.68	1.12	0.52,2.38	0.777	75.8	58.97,87.22	3.16	1.44,6.92	0.004	82/ 64.55
Chinese and 'other'	57.22	29.28,81.20	1.80	0.56,5.79	0.322	55.12	31.54,76.61	1.24	0.46,3.30	0.669	34/ 26.28
Religion											
None	42.33	38.69,46.05	1			49.62	46.43,52.82	1			2024/1264.66
Christian	45.64	39.81,51.60	1.14	0.86,1.52	0.351	54.15	48.94,59.28	1.20	0.94,1.53	0.147	827/532.27
Non-Christian	50.84	36.94,64.61	1.41	0.79,2.51	0.244	54.53	40.68,67.71	1.22	0.69,2.16	0.502	122/ 93.42
Age at Menarche											
<13						52.64	48.66,56.59	1			718/392.98
≥13						49.89	46.32,53.45	0.9	0.72,1.11	0.308	926/523.18

Family Structure (parental living arrangements at 14)											
Lived with both parents	40.63	36.64,44.74	1			47.36	43.90,50.85	1			1804/1225.43
Live with one/neither parent	47.00	41.38,52.69	1.30	0.97,1.73	0.080	58.40	54.21,62.46	1.56	1.25,1.95	<0.001	1036/576.83
Main Source of Sex Education											
Mother or Father	46.86	35.95,58.09	1.27	0.76,2.11	0.355	51.08	44.38,57.74	1.23	0.89,1.70	0.216	345/209.65
Lessons at School	40.97	35.55,46.61	1			45.98	41.64,50.38	1			1057/674.07
Friends	45.29	39.64,51.08	1.19	0.87,1.64	0.276	55.93	50.82,60.91	1.49	1.14,1.96	0.004	784/485.29
Other	44.72	39.66,49.89	1.17	0.86,1.59	0.33	54.98	49.11,60.71	1.43	1.07,1.92	0.016	777/514.59
Ease discussing sex with parents at 14											
Easy with one/both	43.08	36.84,49.55	1			46.53	41.86,51.25	1			880/556.97
Difficult	53.42	41.78,64.69	1.51	0.88,2.60	0.132	55.51	46.02,64.61	1.43	0.93,2.20	0.099	236/156.85
Didn't discuss with either	42.62	38.85,46.49	0.98	0.73,1.33	0.903	53.34	49.68,56.97	1.31	1.03,1.67	0.026	1678/1073.32
Varied depending on topic	32.45	18.37,50.64	0.63	0.29,1.41	0.263	40.01	27.77,53.63	0.77	0.43,1.38	0.374	95/ 60.08
Sex before age 16											
No	36.25	32.28,40.41	1			42.83	39.35,46.38	1			1768/1178.08
Yes	55.34	50.57,60.01	2.18	1.68,2.83	<0.001	66.09	61.94,70.00	2.60	2.06,3.28	<0.001	1209/714.53
Relationship with first sexual partner											
Just/recently met for first time	61.44	53.95,68.43	3.07	2.17,4.36	<0.001	77.69	68.22,84.96	5.38	3.25,8.91	<0.001	355/240.10
Known each other a while, not in steady relationship	48.04	42.74,53.38	1.78	1.34,2.37	<0.001	73.53	68.43,78.06	4.29	3.22,5.72	<0.001	823/519.93
Used to be in steady relationship	54.47	38.88,69.24	2.31	1.20,4.43	0.012	61.7	46.58,74.85	2.49	1.32,4.67	0.005	115/ 74.64
Steady relationship	34.15	30.08,38.47	1			39.31	36.00,42.71	1			1661/1042.87
Married/living together	.	.	.	.	.	16.26	4.86,42.47	0.30	0.08,1.15	0.079	22/ 14.77
Partner's first time too?											
Yes, partner's first time	37.06	32.98,41.33	1			41.6	37.42,45.90	1			1242/801.24
Think it was first time	52.25	37.20,66.91	1.86	0.98,3.53	0.058	68.91	52.66,81.54	3.11	1.53,6.34	0.002	99/ 70.92
Think it was not first time	58.12	46.84,68.62	2.36	1.46,3.82	0.001	67.15	55.46,77.04	2.87	1.71,4.80	<0.001	185/123.71
No, not first time	46.51	41.41,51.69	1.48	1.13,1.94	0.005	55.47	51.74,59.14	1.75	1.39,2.20	<0.001	1350/834.50
Age difference between respondent and first sex partner											
Partner younger than respondent	37.85	30.69,45.57	0.9	0.62,1.30	0.574	53.97	39.55,67.76	1.45	0.79,2.66	0.23	276/204.34
Same age	40.37	36.33,44.56	1			44.73	40.36,49.18	1			1369/905.21
Respondent younger than partner	56.63	50.32,62.73	1.93	1.43,2.60	<0.001	55.06	51.67,58.41	1.51	1.21,1.89	<0.001	1324/779.42

Multivariable regression analyses

Multivariable logistic regressions (Tables 26 and 27) showed a number of factors to be independently associated with sexual competence at first sex, with some differences according to gender. In Model 1, concerned with socio-demographic indicators, IMD quintile and educational level were independently associated with sexual competence among young men and women – with the IMD quintile more strongly associated with sexual competence among men, compared with women. Lower educational level retained its significant association with sexual non-competence among women; however for men, having left school at 16 with no qualifications no longer conferred a statistically significant increased risk of sexual non-competence at sexual debut. The positive relationship between parental social class and sexual competence was sustained among men, though lost statistical significance among women. Among women, but not men, family structure and black ethnicity were independently associated with sexual competence at sexual debut; women who lived with just one or neither parent up to age 14 were 1.27 times more likely to have not been sexually competent at first sex, compared with those who lived with both parents, while women of black ethnicity had over 3 times greater odds of non-competence at sexual debut, compared to women of white ethnicity.

With the addition of the variables relating to learning about sex to the model (Model 2), the pattern of associations between sexual non-competence the socio-demographic variables, observed in Model 1, remained for both genders. Additionally, among female respondents, citing 'friends' as their main source of sex education was associated with 1.54 greater odds of not being sexually competent at first, compared with those whose main source of sex education was school. Women who reported that they had not discussed sexual matters with their parents at age 14, and those who reported such discussions had been 'difficult' had greater odds of being sexually non-competent at first sex (AORs: 1.33 and 1.60, respectively).

Adding to the model whether sexual debut occurred before age 16 (Model 3), caused no substantial changes in the associations observed in the previous two models. The majority of associations with socio-demographic and learning about sex variables retained significance (or borderline significance in the case of family structure and having left school at 16 *with* qualifications among women). An exception was educational level among men, which lost statistical significance in Model 3. In terms of the association observed between sex before 16 and sexual non-competence, women who reported being younger than 16 at sexual debut were

2.65 times more likely to be non-competent, while men who were under 16 had 2.05 times greater odds of not being sexual competent at first sex.

The final model (Model 4) included variables relating to the immediate context within which first sex occurred. With the addition of these contextual variables to the female-only Model 3, the former associations observed between sexual competence at first sex, source of sex education, and ease of communication with parents about sex, were no longer statistically significant at the 5% level. Leaving school at 16 with no qualifications, manual parental social class, and black ethnicity, all continued to be significantly associated with sexual non-competence at first sex among women. A particularly strong association is observed with black ethnicity (AOR: 5.61), though it should be noted that this is based on a relatively small sample size of black women in the model (n=37). Among men, the associations with IMD quintile of residence, having parents of manual social class, and being of mixed ethnicity, retained statistical significance at the 5% level.

As observed in the unadjusted odds ratios, the status of the relationship with the first sexual partner retained its strong associations with sexual competence among women; those who had just/recently met their partner were 4.96 times more likely to have been sexually non-competent at first sex compared with respondents who reported being in a steady relationship with their first sexual partner – similarly, those who knew their partner but were not in a steady relationship, and those who used to be in a steady relationship with that partner at the time of first sex, had 3.92 and 2.21 greater odds of not being sexual competent, respectively. Among men, only respondents who had just/recently met their partner at first sex or who used to be in relationship with that partner were significantly more likely than those in a steady relationship to be sexually non-competent at first sex (AORs: 2.43 and 2.18, respectively). The respondents' knowledge of their first sexual partner's virginity status also continued to be significantly associated with sexual competence – among women, those who were unsure of their partners virginity status, and those who *knew* that it was not their partners first time, were significantly more likely to have been sexually non-competent at first sex. Among the male respondents, only those who *thought* it was not their partners first time had a significantly greater likelihood of not being sexual competent. The age difference between partners at first sex was no longer significantly associated with sexual competence in this adjusted model among women, though among men a borderline significant ($p=0.076$) association remained between reporting having an older partner at first sex and sexual non-competence.

Further analyses (Appendix 5) were conducted, adding in each of the contextual variables (relationship status at first sex, partner's virginity status, and age difference between respondent and partner at first sex) to the model one by one. This identified that relationship status at first sex was responsible for the disappearance of the formerly statistically significant associations between sexual competence and variables relating to source of sex education and communication with parents about sexual matters among women.

Table 26: Multivariable logistic regression examining predictors of sexual non-competence at sexual debut, results adjusted for all other variables in table column (Men n=1194/885.51).

MEN	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
IMD quintile												
1: least deprived	1	.	.	1	.	.	1	.	.	1	.	.
2	1.56	1.00,2.41	0.049	1.50	0.97,2.33	0.068	1.46	0.94,2.26	0.088	1.41	0.91,2.17	0.120
3	1.82	1.17,2.84	0.008	1.80	1.16,2.80	0.009	1.68	1.09,2.60	0.020	1.64	1.06,2.54	0.026
4	2.40	1.51,3.80	<0.001	2.35	1.48,3.73	<0.001	2.28	1.43,3.64	0.001	2.17	1.39,3.39	0.001
5: most deprived	2.21	1.42,3.45	<0.001	2.20	1.42,3.40	<0.001	2.13	1.37,3.30	0.001	1.96	1.26,3.07	0.003
Parental SES												
No response	1.67	1.07,2.63	0.026	1.67	1.06,2.63	0.026	1.7	1.08,2.70	0.023	1.75	1.11,2.77	0.017
Parents iv/v manual	1.58	1.11,2.26	0.012	1.61	1.12,2.32	0.010	1.59	1.10,2.31	0.013	1.54	1.06,2.25	0.023
Parents i/ii/iii non-manual	1	.	.	1	.	.	1	.	.	1	.	.
Education level of respondent												
Left school at 16 with no qualifications	1.87	0.98,3.58	0.059	1.85	0.96,3.53	0.065	1.41	0.73,2.74	0.302	1.35	0.67,2.70	0.403
Left school at 16 with qualifications	1.28	0.91,1.81	0.161	1.27	0.90,1.80	0.180	1.07	0.74,1.54	0.716	1.07	0.74,1.55	0.729
Left school at 17+	1	.	.	1	.	.	1	.	.	1	.	.
Currently 16	1.18	0.71,1.97	0.519	1.20	0.72,2.01	0.475	0.92	0.55,1.52	0.732	0.94	0.55,1.58	0.808
Ethnic Group												
White	1	.	.	1	.	.	1	.	.	1	.	.
Mixed	2.73	1.28,5.82	0.009	2.91	1.35,6.27	0.007	3.24	1.46,7.20	0.004	3.37	1.44,7.86	0.005
Asian	1.11	0.54,2.25	0.780	1.14	0.55,2.36	0.722	1.26	0.61,2.62	0.537	1.47	0.69,3.11	0.318
Black	0.89	0.39,2.06	0.791	0.83	0.36,1.89	0.653	0.73	0.32,1.70	0.466	0.75	0.31,1.77	0.507
Chinese and 'other'	1.96	0.55,6.98	0.298	2.11	0.59,7.53	0.250	2.44	0.66,8.99	0.181	2.31	0.63,8.45	0.206
Family Structure												
Both parents	1			1			1			1		
One parent	1.04	0.75,1.44	0.814	1.05	0.76,1.44	0.785	0.98	0.71,1.34	0.881	1.00	0.73,1.36	0.991
Main Source of Sex Education												
Mother or Father				1.18	0.64,2.20	0.596	1.11	0.61,2.04	0.729	1.02	0.57,1.83	0.943
Lessons at School				1	.	.	1	.	.	1	.	.
Friends				1.04	0.74,1.46	0.816	0.96	0.68,1.35	0.807	0.89	0.63,1.26	0.511
Other				1.01	0.73,1.42	0.931	0.93	0.66,1.31	0.675	0.92	0.65,1.31	0.657

Ease discussing sex with parents at 14						
Easy with one/both		1	.	.	1	.
Difficult		1.65	0.91,2.99	0.099	1.65	0.89,3.05
Didn't discuss with either		0.88	0.62,1.25	0.482	0.91	0.64,1.30
Varied depending on topic		0.69	0.31,1.54	0.363	0.66	0.30,1.47
Sex before age 16						
No					1	.
Yes					2.05	1.53,2.76
Relationship with first sexual partner						
Just/recently met for first time					2.43	1.60,3.69
Known each other a while, not in steady relationship					1.29	0.92,1.79
Used to be in steady relationship					2.18	1.02,4.66
Steady relationship					1	.
Married/living together					.	.
Partner's first time too						
Yes, partner's first time					1	.
Think it was first time					1.64	0.83,3.23
Think it was not first time					2.04	1.13,3.69
No, not first time					1.21	0.88,1.67
Age difference between respondent and first sex partner						
Partner younger than respondent					0.98	0.65,1.49
Same age					1	.
Respondent younger than partner					1.37	0.97,1.95

Table 27: Multivariable logistic regression examining predictors of sexual non-competence at sexual debut, results adjusted for all other variables in table column (Women n=1544/868.54).

WOMEN	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
IMD quintile												
1: least deprived	1	.	.	1	.	.	1	.	.	1	.	.
2	1.15	0.81,1.64	0.427	1.13	0.79,1.61	0.505	1.16	0.80,1.66	0.432	1.11	0.75,1.65	0.596
3	0.96	0.67,1.36	0.798	0.95	0.67,1.35	0.792	0.93	0.65,1.35	0.720	0.86	0.58,1.28	0.459
4	1.42	1.00,2.00	0.047	1.42	1.01,2.00	0.043	1.45	1.01,2.06	0.041	1.41	0.97,2.05	0.070
5: most deprived	1.30	0.91,1.85	0.143	1.28	0.90,1.82	0.168	1.25	0.87,1.81	0.225	1.15	0.78,1.69	0.480
Parental SES												
No response	1.03	0.70,1.53	0.873	1.03	0.69,1.53	0.897	1.02	0.67,1.55	0.941	1	0.64,1.55	0.994
Parents iv/v manual	1.29	0.93,1.77	0.126	1.29	0.93,1.78	0.125	1.31	0.94,1.83	0.107	1.61	1.13,2.29	0.009
Parents i/ii/iii non-manual	1	.	.	1	.	.	1	.	.	1	.	.
Education level of respondent												
Left school at 16 with no qualifications	3.24	1.73,6.08	<0.001	3.21	1.72,5.99	<0.001	2.75	1.47,5.14	0.002	2.62	1.31,5.23	0.006
Left school at 16 with qualifications	1.49	1.11,2.01	0.009	1.51	1.12,2.04	0.008	1.29	0.94,1.75	0.112	1.25	0.89,1.75	0.204
Left school at 17+	1	.	.	1	.	.	1	.	.	1	.	.
Currently 16	0.84	0.53,1.32	0.444	0.83	0.52,1.32	0.435	0.55	0.34,0.89	0.015	0.53	0.32,0.89	0.017
Ethnic Group												
White	1	.	.	1	.	.	1	.	.	1	.	.
Mixed	1.73	0.92,3.26	0.089	1.80	0.96,3.38	0.067	1.78	0.88,3.59	0.108	1.52	0.77,3.01	0.228
Asian	0.96	0.46,2.00	0.912	0.88	0.42,1.88	0.751	1.20	0.56,2.55	0.638	1.96	0.76,5.04	0.162
Black	3.74	1.64,8.54	0.002	3.49	1.53,7.95	0.003	3.95	1.63,9.60	0.002	5.61	1.99,15.83	0.001
Chinese and 'other'	1.38	0.49,3.90	0.541	1.31	0.47,3.63	0.608	1.76	0.64,4.84	0.275	3.20	0.87,11.75	0.080
Family Structure												
Both parents	1			1			1			1		
One parent	1.27	0.99,1.63	0.056	1.27	0.99,1.63	0.064	1.25	0.96,1.62	0.096	1.11	0.84,1.46	0.462
Main Source of Sex Education												
Mother or Father				1.35	0.92,1.97	0.125	1.30	0.88,1.93	0.186	1.23	0.81,1.88	0.327
Lessons at School				1	.	.	1	.	.	1	.	.
Friends				1.54	1.16,2.04	0.003	1.46	1.09,1.97	0.011	1.24	0.91,1.71	0.174
Other				1.32	0.97,1.79	0.074	1.21	0.88,1.67	0.230	1.09	0.77,1.55	0.614

Ease discussing sex with parents at 14								
Easy with one/both		1	.	.	1	.	.	1
Difficult		1.60	1.00,2.55	0.050	1.58	0.96,2.58	0.070	1.41 0.87,2.30 0.164
Didn't discuss with either		1.33	1.01,1.77	0.046	1.40	1.04,1.88	0.026	1.31 0.95,1.82 0.096
Varied depending on topic		0.85	0.46,1.56	0.604	0.80	0.44,1.48	0.482	0.75 0.39,1.45 0.387
Sex before age 16								
No								
Yes					2.65	2.05,3.42	<0.001	2.88 2.18,3.81 <0.001
Relationship with first sexual partner								
Just/recently met for first time								4.96 2.89,8.52 <0.001
Known each other a while, not in steady relationship								3.92 2.83,5.44 <0.001
Used to be in steady relationship								2.21 1.10,4.47 0.026
Steady relationship								1 . .
Married/living together								0.14 0.02,1.15 0.067
Partner's first time too								
Yes, partner's first time								1 . .
Think it was first time								2.84 1.29,6.24 0.009
Think it was not first time								2.36 1.25,4.44 0.008
No, not first time								1.41 1.06,1.87 0.018
Age difference between respondent and first sex partner								
Partner younger than respondent								1.48 0.73,2.97 0.276
Same age								1 . .
Respondent younger than partner								1.05 0.80,1.37 0.746

7.1.3 Discussion

Summary of findings

These analyses provide an exploration of the predictors of a novel measure of the first sexual intercourse experience: sexual competence. Rather than focussing on whether first intercourse occurred too 'early' as defined by chronological age, this construct is concerned with sexual debut occurring when the individual is 'competent' or 'ready'.

The measure of sexual competence was constructed rather opportunistically by Natsal-2 researchers combining existing variables which they believed to be necessary for a healthy first sex. Despite its unorthodox beginnings, these analyses provide evidence that the measure of 'sexual competence' demonstrates external-criterion validity, in that the associations observed with hypothetically related factors are statistically significant and in the direction expected. Furthermore, the finding that age at sexual debut does not explain all of the variation observed in sexual competence, and nor does it account for the associations found with other antecedent factors, suggests that this measure of sexual competence is not merely a function of age at first sex, but rather, a distinct dimension of the experience in itself.

Among young men and women, indicators of socio-economic position were associated with sexual competence at first sex. The variables relating main source of sex education and ease discussing sexual matters with parents were only independently associated with sexual competence among female respondents. After adjusting for a variety of factors proximal to the context of first sex, such as the nature of the relationship with, and virginity status of, the first sexual partner, some of the previous associations observed between the more distal factors and sexual competence at sexual debut were reduced to non-significance, perhaps suggestive of a mediating role played by the immediate context of first sex.

Interpretation – contextualising with other studies

Socio-demographic factors

Using the Indices of Multiple Deprivation (IMD) as a socio-economic indicator in these analyses has its weaknesses; many young people, particularly students, live in poorer areas during this stage of life, which are not necessarily indicative of the social class they were exposed to while growing up and when they transitioned into sexual activity. Despite this, an association between IMD quintile and sexual competence at first sex was still observed in the direction expected:

those living in more deprived areas were more likely to have not been sexually competent at first sex. A relationship between neighbourhood deprivation and sexual behaviour has been found in a variety of contexts: a study of neighbourhoods in Chicago found that youth living in communities with greater concentrated poverty were more likely to be sexually active, compared to young people living in less disadvantaged areas (Browning et al., 2008). A study of young people in South Africa found greater neighbourhood disadvantage to be associated with earlier onset of sexual activity and inconsistent condom use (Burgard and Lee-Rife, 2009). Moreover, teenage pregnancy rates in the UK are known to be greatest in areas of high deprivation (Social Exclusion Unit, 1999). It has been suggested that neighbourhood disadvantage can work to shape localised social and behavioural norms relating to sexuality (Parker, 2009), and that living in an disadvantaged area can limit young residents' perception of the accessibility of education and a career, meaning they do not consider the potential consequences of unprotected sex to be at the expense of a successful career (Smith and Roberts, 2011).

Consistent with the current findings, the educational level of young people was found to be associated with sexual competence at first sex in analyses of Natsal-2 data (Wellings et al., 2001). This relationship may be indicative of the association between greater educational/career aspirations and reduced sexual risk-taking among adolescents, which has been reported in the US (Gloppen et al., 2010; Kirby, 2002) and the UK (Blenkinsop et al., 2004; Social Exclusion Unit, 1999). This association could also be indicative of a reversed relationship; it is possible that respondents who had sex before 16 and who had not been sexually competent are more inclined to subsequently leave school at 16 – perhaps due to unintended pregnancy (Spriggs and Halpern, 2008).

For young people, such as those under focus in this study, indicators of parental social class are optimal measures of the socio-economic identity of the respondent, given the constant influence of the parent throughout childhood and adolescence. The association between low socio-economic status of parents and increased likelihood of non-competence resonates with other research showing lower parental social class to be associated with a higher likelihood of having had sex by age 14 (Henderson et al., 2002). Higher parental educational level was found to predictive of consistent condom and contraceptive use in adolescents in the Scottish longitudinal SHARE study (Wight et al., 2006). The influence of parental social class on sexual competence may be explained by the effect that life aspirations have on sexual behaviour (Valle et al., 2005; Blenkinsop et al., 2004; Social Exclusion Unit, 1999). It is plausible that those young people who come from a background of lower SES may have grown up in a context whereby certain aspirations may seem out of reach or not even considered, meaning that the potential

costs conferred from a non-competent first sexual intercourse are not perceived as particularly great. Previous research has found that individuals of lower socio-economic status have lower levels of perceived control (Bosma et al., 1999; Bailis et al., 2001), which could be an important psycho-social determinant sexual competence.

Previous research has also identified a relationship between family structure while growing up and sexual behaviour in adolescence; disrupted family structure was associated with early sexual debut in Natsal-1 (Kiernan and Hobcraft, 1997) and Natsal-2 (Wellings et al., 2001) and in the Health Behaviour Among School-Aged Children (HBSC) surveys (Lenciauskiene and Zaborskis, 2008); with non-use of contraception at first sex in a study of young people in Northern Ireland (Schubotz et al., 2004); and with lower reported 'wantedness' of first sex among female respondents in a US study (Abma et al., 1998). Due to the adjustment in the current analyses for IMD, educational level, and parental social class, it is unlikely the effect of disrupted family structure is actually due to economic factors. The current analyses found that family structure was only associated with sexual competence among female respondents. 80% of those not living with both natural parents cite the reason for this as being divorce, and in the majority (91%) of lone-parent families in Britain, the children continue to live with their mother (Office for National Statistics, 2012). Therefore, the gender difference in the observed association with family structure may be due to the specific effect that father absence has been reported to have on daughters' sexual behaviours in particular; increasing their likelihood of starting to have sex at a younger age and experiencing a teenage pregnancy (Ellis et al., 2003).

Ethnicity was also associated with sexual competence; specifically women of black ethnicity and men of mixed ethnicity were less likely to have been sexually competent at first sex, compared to white men and women. Variations in sexual behaviour have been observed across different ethnic groups in analyses of Natsal-2 (Fenton et al., 2005). A study of adolescents in London showed contraceptive use at sexual debut was lower among Black men and Asian women, compared with the other ethnic groups (Coleman and Testa, 2007). Studies of young people in Scotland and Southern England found that members of 'other' ethnic groups (not White, Asian or Black) were more likely to report feeling pressured by a partner at sexual debut (Wight et al., 2008). Given that the observed relationships between sexual competence and ethnicity remain even after controlling for the three indicators of socio-economic status (ethnicity is often associated with SES), it seems that the influence of culture rather than economic factors may be playing a role.

Learning about sex

With the addition of the variables concerned with how the respondent learnt about sex to the regression models, little change was observed in the effect that the socio-demographic variables had on sexual competence. This indicates that the way in which the respondent learnt about sex does not appear to have a mediatory role between the indicators of socio-demographic background and sexual competence at sexual debut.

Compared with those who reported that it had been 'easy' to discuss sex with one or both parents at age 14, female respondents who had not talked with either parent about sex, or who found such discussion 'difficult' at all, were significantly more likely to have not been sexually competent at first sex. These results are generally consistent with a study of young people in Northern Ireland, which found communication with parents about sex to be associated with greater contraceptive use at first sex – though this study detected a relationship among men as well as women - however in the same study, lack of communication with parents about sexual matters was associated with younger age at first sex among female, but not male respondents (Schubotz et al., 2004). Parkes et al. (2011) also found frequency and ease of parental communication about sexual matters to be associated with delayed first intercourse among Scottish adolescents. Having poor general communication with parents has been linked with higher levels of reported pressure from partner at sexual debut in other UK-based studies (Wight et al., 2008). A US study of 13-17 year olds found that communication with parents about sexual relationships and sexuality, as well as more general communication, was associated with delayed sexual initiation (Aspy et al., 2007). Moreover, in the same study, among young people who were sexually active, family communication about delaying sexual activity, birth control and STI prevention, was associated with greater use of contraceptives, even when adjusted for other demographic and socio-economic factors (Aspy et al., 2007). Communication with parents about sex may also be a proxy for parenting style; parenting type has been shown to exert an influence on sexual behaviour; Wight et al (2006) found higher parental monitoring to be associated with older age at sexual debut and greater condom and contraceptive use among females in the SHARE study, carried out among adolescent respondents in Scotland. Moreover, Parkes et al. (2011) found parental supportiveness to be predictive of greater sexual autonomy and sexual relatedness at first intercourse.

The way in which parental communication influences sexual competence may work in two, not necessarily mutually exclusive, ways; the content of the conversation with parents may provide young people with the knowledge and skills required to negotiate a positive and safe sexual experience, or just in having any conversation in general about sexual matters may help dispel

the 'silence' which often surrounds sex and particularly, adolescent sexual desire (Welles, 2005), empowering the young person involved to feel comfortable vocalising his or her wants and intentions to a partner, so enabling a sexually competent first experience. Research among young college women in the US found communication with the sexual partner was associated with lower discrepancies between wanted and experienced sexual activities (Blunt, 2012), while Stone and Ingham (2002) identified partner communication to be a significant predictor of contraceptive use at first sex among a sample of British teenagers. However, it does seem that the 'ease' of these discussions is equally as important as whether they occur at all – perhaps the experience of difficult discussion with parents about sex can be salient enough to discourage future communication about wants and needs to sexual partners.

The association between reporting 'friends' as the main source of sex education and sexual non-competence among women is consistent with analyses of Natsal-2 data, which detected such an association among both genders (Wellings et al., 2001). An alternative to the positive-effectiveness-of-school-sex-education explanation for this association is that having had friends provide the majority of one's sexual education may actually have a detrimental effect on the nature of first sex. Moreover, it may indicate a high level of communication about sex between peers, potentially leading to a (perhaps unrealistic) view of how many of one's companions are having sex, and also, to pressure from peers to engage in sex oneself.

The lack of association among men between source of sex education and sexual competence in the current study, and the finding that school as a main source of sex education is only superior to the 'friends' category among women, may be due to a number of factors. For one, this question asks the respondent to identify their *main* source of sex education; however, it is likely that the cohort of 16-24 year olds interviewed during this Natsal survey will have had greater access to different sources of information than previous cohorts, given the accessibility of the internet. It may be unrealistic to identify a 'main' source of sex education in this context. It also should be noted that British schools are known to provide varying qualities of sex education (The Office for Standards in Education, 2010) and research with young people has found that there seems to more emphasis on the biological aspects of sex, as opposed to issues of relationships, negotiation and communication strategies (Macdowall et al., 2006). Meaning that even if school is identified as the *main* source of sex education, the quality and content of British schools' Sex and Relationship education may not consistent enough to exert an effect on the nature of young persons' transition into sexual activity.

The finding that neither source of sex education nor ease of discussing sex with parents was associated with sexual competence among young men, even in unadjusted analyses, may be

due to gender differences in the requirement for communication and negotiation skills to have an optimal first sexual intercourse. Women were less likely than men to report that their sexual debut occurred at the 'right time' – perhaps discussing sex with parents and sex education is important for building women's skills in resisting unwanted sexual encounters, while these skills are less necessary for men, who generally give more positive accounts of first intercourse as they are more likely to just be happy that they had had sex (Ingham et al., 1991; Holland et al., 2000) and less likely to report experiencing pressure from their partner (Hyde et al., 2008; Ingham et al., 1991).

Context of first sex

Age

Despite the obvious correlation that exists between age at sexual debut and sexual competence (Table 24), age at first sex does not explain all of the variance in sexual competence, indicating that age is an overly simplistic indicator of the nature of first sex. Furthermore, the associations observed between all the background and learning-about-sex variables were independently predictive of sexual competence, even when adjusted for whether sexual debut occurred before 16. The same analysis was also conducted using the categorical age at first sex variable, which produced similar results (see Appendix 6). This provides further evidence that the measure of sexual competence represents a distinct dimension of first sex, which is not simply a function of age at occurrence.

Nonetheless, age at first sex is significantly associated with sexual competence. Adolescence has been referred to as the 'second critical period', due to the high degree of brain development during this time. Neurological research has identified that during adolescence, much development occurs within the brain regions and systems responsible for the regulation of behaviour and emotion, and evaluation of risk and reward. Some have speculated that the changes in arousal and motivation triggered by pubertal maturation "precede the development of regulatory competence in a manner that creates a disjunction between the adolescent's affective experience and his or her ability to regulate arousal and motivation" (Steinberg, 2005) (p.70). The neurological development during adolescence is believed to underpin improvements in various aspects of executive functioning, including long-term planning, meta-cognition, self-evaluation, self-regulation, and the co-ordination of affect and cognition, and hypothetically, these cognitive skills may contribute to a young person's ability to negotiate a sexually competent sexual debut. However, this cognitive developmental explanation assumes a direct

and substantial effect of individual-level psychological skills in determining sexual behaviour. Such a view does not translate well into explaining variation in sexual behaviour; it is well established that a multitude of factors, including, but also beyond the individual-level, contribute to sexual behaviour (Vanwesenbeeck et al., 1999).

It is possibly more plausible that age at first sex exerts an influence on the nature of the sexual debut due to the particular social context in which sex at a younger age occurs. Adolescent sex is often met with disapproval, particularly that which occurs before the age of 16 – the legal age of sexual consent in Britain – and this disapproval may limit younger persons' actual or perceived access to the relevant information, advice, and/or services, required for the achievement of sexual competence at first sex (Aggleton and Campbell, 2000).

Relationship

The status of the partnership has been found to influence the nature of the sexual experience in previous research; a Scottish study found that those who were in 'casual' partnerships at sexual debut were more likely to report feeling pressured and regret of first intercourse (Wight et al., 2008), while those who had been in the relationship for more than a month were significantly more likely to have used a condom at first sex (Henderson et al., 2002). A study conducted in the Republic of Ireland found that the less established the romantic relationship, the greater the likelihood that respondents wished they had waited longer before having sex (Layte and McGee, 2007). Smiler et al. (2005) analysed the correlates of a positive first sexual intercourse among 335 US undergraduates. Of relevance to the current findings, a longer length of relationship prior to first sex was positively associated with participants reporting that their sexual debut was a positive, and loving, experience.

The current finding that the relationship between the respondent and partner at first sex is strongly associated with sexual competence, particularly among women, is not surprising. It seems reasonable that conditions that represent sexual competence are more easily met within the context of a relationship, whereby communication and awareness of intentions may be better established. It is also a significant finding that this relationship is of a greater magnitude among women; perhaps providing further evidence for the previously reported gender differences that exist, whereby, in general, relationship and emotional factors are more important for the way that women evaluate their sexual experiences (Else-Quest et al., 2005; Camoletto, 2011). In Ingham et al.'s. (1991) qualitative study involving 16-25 year olds, female participants' regret about their first sexual experience often seemed to be related to the contrast between their prior intentions that first sex would occur in the context of a stable and romantic relationship, and the reality of their sexual debut being quite different, suggesting that

the current finding of a strong association between relationship status and competence at first sex may not only be due to steady relationships allowing for more direct communications about one's intentions, but also to the fact that not having been in a steady relationship impacts on the way girls subsequently evaluate the sexual experience.

Relationship status at first sex could also be expected to be related to the length of time the relationship continued after first sex occurred. Given the retrospective nature of the sexual competence measure, along with the highly subjective psychosocial measures of willingness, autonomy, and particularly timing, it is highly probable that what happens next in the course of that first relationship will contribute to the way in which these questions are answered. Moreover, the status of the relationship after first sex occurred may impact on whether participants record their relationship within which first sex occurred as 'steady' or not. Therefore, the predictive effect of relationship status may also be due to the nature of the relationship *after* first sex occurred, and the way in which this shapes the subsequent evaluation of that first sexual encounter. Analyses of the Dunedin Multidisciplinary Health and Development study in New Zealand (presented in the next section), found that female participants' sexual competence at first sex was significantly associated with the length of time that the relationship had continued for after that first sexual encounter, while a study conducted in the Republic of Ireland identified that the longer the relationship had continued after sex was associated with a reduced likelihood of participants reporting that they wished they had waited longer before having sex (Layte and McGee, 2007).

The status or length of partnership within which first sex occurs may also be indicative of the degree to which the sexual encounter may have been planned or spontaneous. In Smiler et al's, (2005) study, a measure of 'intentionality', based on participants' levels of agreement with various statements relating to planning, spontaneity, and prior discussion of first sex, was investigated for its relationship with the experience of sexual debut. Increased intentionality was positively associated with having had a positive, empowered, and loving, first sexual intercourse, among female respondents. Among men, intentionality was a significant predictor of the encounter being characterised as 'loving'. Similarly, Henderson et al's. (2002) study of Scottish adolescents found that the degree of planning for first sexual intercourse was positively associated with condom use at sexual debut, while Layte and McGee's (2007) study in the Republic of Ireland found that greater planning for sexual debut was associated with a reduced likelihood of feeling regret. Therefore, it is possible that in the current study, the effect of relationship status at first sex on sexual competence is partially due to the potential for a higher degree of planning within longer, established relationships. Analyses of the longitudinal Dunedin Multidisciplinary Health and Development study (presented in the next section), found

that the degree of planning for sexual debut reported by participants' was related to the nature of the partnership, and was also independently associated with sexual competence at first sex.

The partner

For female respondents' first sexual intercourse, if they stated that they knew it had also been their partner's first time, there was an increased likelihood of having had a sexually competent experience. This is consistent with Dickson et al's (1998) New Zealand study which found that mutual willingness for both partners was greater among respondents who reported that it was also their partner's first time. Ingham et al's (1991) qualitative study with 95 British young people identified that when both partners were inexperienced, the period between becoming a couple and having sex was relatively longer – this may suggest that the inexperience of a partner provides a relationship context which is more accepting of waiting until one feels 'ready' to have sex, or that at least the longer length of time prior to first sex provides more opportunities for the discussion of each other's sexual intentions and desires.

Respondents who had answered that they didn't know whether it had been their partners' first time, were asked the prompt: "do you think it was his/her first time, or not?" From the current analyses, it seems that those who *thought* it was, or was not, their partners first time, were also less likely to have had a sexually competent sexual debut; this uncertainty of the partner's sexual history may indicate lack of communication or prior knowledge of the partner. This finding is consistent with the results of Ingham et al's. (1991) study, in which those who did not know whether their first sexual partner had been a virgin or not were less likely to have used contraception at first sex. Among male respondents, only those who stated that they *thought* it was *not* their partner's first time had a significantly reduced likelihood of being sexually competent at first sex; indicating that the combination of uncertainty, along with the perceived greater relative experience of the partner, put young men at greater risk of having a non-competent first sexual experience.

Age differences between partners have also been previously linked with the experience of first sex; having a relatively older sexual partner at sexual debut has been associated with lower reported 'wantedness' of sex by women (Abma et al., 1998), greater pressure from partner at sexual debut (Wight et al., 2008) and reduced likelihood of using a condom at sexual debut (Mercer et al., 2006). In the unadjusted analyses, having a relatively older first sexual partner was associated with an increased likelihood of not being sexually competent. However, in the multivariable analyses, no such relationship was detected – perhaps due to the adjustment for the other variables relevant to the immediate context of first sex. Respondents were categorised as having been younger, the same age, or older than their partner; it may be that a greater

magnitude of age difference is required for the power relations to be swayed in such a way that an independent association with sexual competence is maintained.

7.1.4 Limitations

As is the case with most studies analysing observational data, there is always a possibility that the associations detected are due to unmeasured and/or unknown confounding factors. Many factors that were not measured in the Natsal-3 study have been shown to be associated with the sexual behaviour of young people, and therefore, may be relevant influences for sexual competence at first sex. For example, previous studies have found a relationship between personality characteristics of the individual and sexual behaviours; 'sensation-seeking' and 'locus of control', have been linked with risky sexual behaviour and early sexual debut in studies of young people in the US (L'Engle et al., 2006; Donohew et al., 2000; Gloppen et al., 2010). Analyses of the New Zealand cohort study (the Dunedin Multidisciplinary Health and Development study) found significant predictive effects of 'negative emotionality' and 'constraint' (measured at age 18) on unsafe sexual behaviour at age 21 (Caspi et al., 1997). The influence of body-image and self-esteem has also been explored; in a study of Norwegian youths, girls who had negative body-image were more likely to have had sex by the age of 15 or 16 years (Valle et al., 2009), while Blenkinsop et al (2004) found low self-esteem to be associated with lack of contraceptive use at first sex in a sample of British young people.

Life aspirations, such as the desire to go to university, have consistently been associated with less sexual risk-taking among adolescents in the US (Gloppen et al., 2010, Kirby, 2002) and the UK (Blenkinsop et al., 2004, Social Exclusion Unit, 1999), and though this factor may have been tapped into by variables relating to family SES and educational level, no explicit measure of aspirations were included in Natsal-3.

Another important influence in young persons' lives is school. In a study of Scottish adolescents, girls who disliked school were more likely to have unprotected sex and experience pregnancy, compared with those who felt ambivalent about school (Bonell et al., 2005), while analysis of a longitudinal UK dataset found that disliking school at age 10-11 was predictive of early, and risky, sexual behaviour (Parkes et al., 2014). School ethos has also been linked to behaviour, including sexual behaviours. Bonell et al (2007) argue that interventions promoting positive school ethos might be beneficial to the pupils' sexual health. School-related factors such as these were not measured in the Natsal-3 survey.

The Natsal-3 survey relies on retrospective self-reports. With such methodology, there is a danger of recall bias. This could explain the strong association observed between the nature of

the relationship at first sex and sexual competence at first sex; perhaps those who reflect on the first sexual intercourse more positively, and therefore are more likely to be classified as sexually competent, will also be more likely to recall that they were in a 'steady' relationship at the time.

Another consideration is that though this study focuses on a measure which may be a better way of assessing the nature of first sex than chronological age, those respondents who reported that their sexual debut occurred at age 12 or younger were not asked the sexual competence questions about that very first time, rather they were questioned about the context of the first sexual intercourse they experienced since the age of 13. This was due to the Natsal-3 researchers wanting to ensure that interviewees were not probed about potentially non-consensual early relationships. However, this relies on an assumption which may not be true; some respondents whose sexual debut occurred at age 12 may well have had a consensual experience.

Finally, the response rate to Natsal-3, at 57.7% (Erens et al., 2013), potentially limits the degree to which these findings are representative of the wider population. Although data are weighted on demographic characteristics to more closely reflect the wider British population, it is nevertheless possible that those who agreed to take part differ from those that do not.

7.1.5 Conclusions and Implications

The implications of this study are two-fold; firstly, the analyses provide evidence for the external-criterion validity of the measure of sexual competence at sexual debut; and secondly; the results are of relevance for public health efforts in enabling identification of young people who are less likely to have had a sexually competent first sexual intercourse.

Relevance for external criterion validity

The finding that age at sexual debut is correlated with sexual competence at debut provides evidence of external-criterion validity. It was hypothesised that a measure of sexual competence should be able to discriminate between individuals who were of different ages at first sex, and this measure does so in the direction expected; individuals who were older at first sex were more likely to be sexually competent. Despite the correlation between age at sexual debut and sexual competence, age does not explain all variation in competence, which provides empirical evidence that chronological age alone is an overly simplistic indicator of the nature and appropriateness of the onset of sexual activity.

Similarly, the statistically significant association observed between relationship status at sexual debut and sexual competence is an important finding for the external-criterion validity of this measure. It seems reasonable that first sex which occurs within a stable relationship may be a

more facilitating context in which sexual competence can be demonstrated. The measure of sexual competence taps into the experience of first sex, which is fundamentally an interaction between two people; the relationship within which first sex occurs is likely to help or hinder the achievement of a sexually competent first intercourse. Moreover, the statistically significant associations observed with antecedent factors are in the direction expected based on previous research concerned with predictors of sexual behaviour in young people – further supporting the case for the external-criterion validity of this measure. That these associations were retained when adjusting for age at first sex supports the conclusion that the measure of sexual competence is distinct from age.

The evidence suggestive of external-criterion validity, and that sexual competence is not simply a function of age, but a distinct dimension of the first sexual intercourse in itself, supports the future use of this measure in research concerned with sexual behaviour among young people.

The linguistic properties of the terms ‘sexual competence’ or ‘sexually competent’ imply that we are referring to a trait that an individual does or does not have. However, the individualistic nature of ‘sexual competence’ is questioned by the results of these analyses. The nature of the relationship within which first sex occurred, along with the virginity status of that first sexual partner, demonstrated the strongest associations with sexual competence at first sex in the adjusted analyses. This provides evidence to suggest that the measure of sexual competence is not only measuring a stable trait of a single individual, but that sexual competence is demonstrated through a combination of individual factors and importantly, the dyadic nature of interaction with the partner at first sex. Perhaps our referral to *individuals* as being ‘sexually competent’ or not is inappropriate; it may be more pertinent to discuss this in terms of the *experience* of first sex, as we may not be measuring attributes of the individual, but of the encounter itself. Nonetheless, it is also possible that a person who embodies the trait of ‘sexual competence’ may be better equipped to ensure that the encounter occurs within a particular relationship context and is a positive experience.

Public health relevance

Sexual competence at sexual debut is arguably an important outcome in itself. A sexual experience that is characterised by equal willingness, autonomy of decision, acceptable timing, and the use of a reliable method of contraception is surely more positive than an encounter that does not meet each of these conditions. Furthermore, given the concept’s congruency with the WHO definition of sexual health, this measure is likely to identify a first sexual encounter that

was healthy: physically, emotionally, and socially. Therefore, the predictors of sexual competence are of public health relevance for understanding what factors may influence sexual competence at first sex, and furthermore, where interventions to improve the conditions of first sex may be best targeted. Furthermore, analyses presented in Chapter 8 find that sexual competence at first sex is independently associated with various indicators of subsequent sexual health – if such a relationship is believed to be causal, then targeted interventions for enabling at-risk young people to have a more positive and healthy first sexual experience may result in improvements in sexual health that continue into adulthood.

7.2 SECTION 2: Exploring the association between sexual competence at sexual debut and relationship status, continuation of the relationship after first sex, and the degree of expectation/planning for first sex

7.2.1 *Introduction*

In the previous section (antecedent factors associated with sexual competence at first sex), relationship status at first sex was identified to have a particularly strong association with sexual competence at first sex. The analyses below use data from the Dunedin Multidisciplinary Health and Development Study to further explore the association between relationship status and sexual competence, using two extra questions that were not asked in Natsal-3 regarding the continuation of the relationship after first sex occurred, and the degree of expectation/planning for first sex.

As discussed previously, the retrospective nature of the sexual competence measure and the inclusion of highly subjective measures of willingness, autonomy, and timing, make it likely that the nature of the relationship *after* the occasion of first sex will contribute to way in which these questions are answered. Furthermore the status of the relationship after first sex occurred may contribute to whether participants record the relationship within which first sex occurred as 'steady' or not. Therefore, the analyses below aim to explore whether the association between relationship status and sexual competence may be due to the nature of the relationship after first sex occurred, and the way in which this shapes the subsequent evaluation that first sexual encounter.

Another factor related to the status or length of partnership within which first sex occurs could also be the degree to which the sexual encounter may have been expected, planned or spontaneous. Previous research has identified an association between the degree to which sexual debut has been 'planned' and having had a positive (Smiler et al., 2005), protected (Henderson et al., 2002) and non-regretted first sex (Layte and McGee, 2007). The analyses presented in this section also aim to explore whether the degree of planning for first sex plays a role in the association between relationship status and sexual competence at first sex – given the potential for a higher degree of planning within longer, established relationships.

7.2.2 *Methods*

Participants and measures

These analyses used data from the Dunedin Multidisciplinary Health and Development Study (DMHDS) (see Silva (1990) for a detailed description). The DMHDS is a longitudinal study of a cohort born between April 1st, 1972, and March 31st, 1973 in the city of Dunedin, New Zealand's South Island. 91% of the eligible births participated in the 3 year old assessment, providing a base sample of 1037 (52% male, 48% female). The children's fathers were representative of the social class distributions in the general population of New Zealand's South Island, and with only 7% identifying themselves as Maori or Polynesian, the sample also matched the ethnic make-up of the South Island.

At the age 21 assessment (carried out in 1993-94), data about health-behaviours, including first sexual intercourse, were collected from 961 participants (92.7% retention). The sexual behaviour questions were presented via a computer with an interviewer in the room for assistance, but who could not see the responses entered by the participant. The four questions relating to the experience of first sex that were used to derive the measure of 'sexual competence' in Natsal were asked at age 21 in the DMHDS. Participants were also asked about the nature of the relationship in which first sex occurred, and two questions that were not included in the Natsal survey, regarding the continuation of the relationship after first sex, and the degree of expectation/planning for first.

Statistical analysis

Logistic regression analysis was employed in order to assess the associations between various explanatory variables and sexual competence at first sex. Further multivariable logistic regression analysis was conducted to focus on the associations between three key variables (relationship status at first sex, continuation of the relationship after first sex, and expectation/planning for first sex) and sexual competence at first sex. All analyses were conducted separately for men and women, restricted to those who reported that they had ever had sexual intercourse, using Stata version 13.

7.2.3 Results

Table 28: Description of DMHDS sample by key variables (age 21 and ever had heterosexual intercourse)

	Men (n=419)		Women (n=421)		N
	%	95% CI	%	95% CI	
Socio-economic status					
High SES	17.70	14.33,21.67	25.18	21.25,29.56	180
Mid SES	50.24	45.46,55.03	50.12	45.34,54.89	421
Low SES	32.06	27.75,36.70	24.70	20.81,29.06	238
Education					
None	17.56	14.17,21.56	9.62	7.13,12.85	112
School cert	20.49	16.85,24.68	21.63	17.93,25.86	174
6th form cert	24.39	20.47,28.79	28.37	24.23,32.90	218
Higher school cert	12.93	10.00,16.55	13.46	10.50,17.10	109
Uni bursary or scholarship	24.63	20.69,29.05	26.92	22.87,31.40	213
Sex before 16					
No	69.44	64.79,73.72	66.27	61.56,70.66	559
Yes	30.56	26.28,35.21	33.73	29.34,38.44	265
Partner's first time too?					
No	46.14	41.37,50.97	62.92	58.17,67.43	454
Yes	29.71	25.49,34.30	20.57	16.96,24.73	209
Unsure	24.15	20.26,28.52	16.51	13.24,20.39	169
Relationship status					
Just/recently met	28.54	24.36,33.11	18.97	15.37,23.19	191
Knew each other	33.66	29.24,38.39	27.18	22.98,31.83	244
Steady relationship	33.66	29.24,38.39	52.31	47.33,57.24	342
Prostitute/'other'	4.15	2.59,6.58	1.54	0.69,3.39	23
Relationship continued after sex?					
Yes, still together	12.38	9.50,15.97	16.05	12.69,20.11	111
No, did not continue	40.35	35.66,45.22	25.79	21.63,30.44	261
Did continue, not still together	47.28	42.44,52.17	58.16	53.12,63.03	412
Planning of first time					
Spur of the moment	49.51	44.68,54.35	30.23	25.85,35.01	320
Expected then/soon	30.49	26.21,35.13	46.51	41.58,51.51	305
Planned	12.93	10.00,16.55	18.60	15.02,22.81	125
Can't remember	7.07	4.95,10.00	4.65	2.95,7.27	47

Table 29: Components of sexual competence measure – proportions (95% CI) by sex (DMHDS)

	Equally willing % (95%)	Autonomous reason % (95%)	Right time % (95%)	Contraceptive use % (95%)	Sexually competent % (95%)
Men	76.33(71.98,80.19)	86.03(82.27,89.10)	48.54(43.73,53.38)	59.61(54.78,64.26)	26.83(22.75,31.34)
Women	52.98(71.98,80.19)	83.60(79.50,87.01)	38.14(33.43,43.09)	71.79(67.11,76.05)	22.43(18.68,26.69)
N	833	779	800	801	829

Table 28 presents a description of the DMHDS sample at age 21 by key variables and Table 29 presents the proportion of respondents who positively endorsed each component of the sexual competence measure, as well as the proportion of men and women classified as sexually competent at first sex. Compared with the Natsal-3 respondents, a lower proportion of the DMHDS participants reported that they were equally willing at first sex, that first sex happened at the right time, and that they used a reliable method of contraceptive at first sex – no significant difference is observed between the two samples in the proportion who gave an autonomous reason for first sex. Due to these differences, a significantly lower proportion of DMHDS participants were classified as sexually competent at first sex (women: 27%, men: 22%) compared to Natsal-3 respondents (men: 56%, women: 48%).

Table 30: Proportion not sexually competent at first sex by key variables and unadjusted odds ratios (DMHDS)

Outcome: sexual non-competence	Men					Women				
	%	95% CI	Odds ratio	95% CI	p-value	%	95% CI	Odds ratio	95% CI	p-value
Education										
None	82.86	73.95,91.76	1.88	0.88,4.02	0.103	91.18	81.48,97.18	4.27	1.22,15.01	0.024
School cert	72.15	62.19,82.12	1.01	0.52,1.94	0.982	79.01	70.08,87.95	1.56	0.79,3.07	0.202
6th form cert	65.66	56.24,75.07	0.74	0.41,1.36	0.335	74.07	65.76,82.39	1.18	0.65,2.15	0.587
Higher school cert	71.15	58.70,83.61	0.96	0.46,2.01	0.913	75.47	63.76,87.18	1.27	0.60,2.70	0.531
Uni bursary or scholarship	72.00	63.14,80.86	1			70.75	62.04,79.47	1		
Socio-economic status										
High SES	65.28	54.19,76.37	0.51	0.27,0.97	0.040	72.28	63.49,81.06	0.51	0.25,1.04	0.065
Mid SES	71.22	65.00,77.44	0.67	0.40,1.13	0.132	73.71	67.49,79.93	0.55	0.29,1.05	0.070
Low SES	78.63	71.57,85.68	1			83.52	75.84,91.19	1		
Sex before 16										
No	68.1	62.61,73.59	1			68.99	63.33,74.66	1		
Yes	81.6	74.77,74.77	2.08	1.24,3.49	0.006	88.98	83.50,94.45	3.63	1.96,6.71	<0.001
Partner's first time too?										
No	73.02	66.66,79.37	1			78.42	73.21,83.64	1		
Yes	66.39	57.96,74.82	0.73	0.45,1.20	0.212	56.47	45.85,67.09	0.36	0.21,0.60	<0.001
Unsure	78.57	70.39,86.75	1.36	0.76,2.42	0.304	91.67	84.60,98.73	3.03	1.15,7.95	0.025
Planning of first time										
Spur of the moment	81.59	76.21,86.97	1			91.38	86.24,96.52	1		
Expected then/soon	64.8	56.38,73.22	0.42	0.25,0.69	0.001	75.42	69.08,81.75	0.29	0.14,0.60	0.001
Planned	53.85	40.14,67.55	0.26	0.14,0.50	<0.001	50.00	38.35,61.64	0.09	0.04,0.21	<0.001
Can't remember	79.31	64.28,94.34	0.86	0.33,2.27	0.768	93.75	64.89,99.19	1.42	0.17,11.85	0.749
Relationship status										
Just/recently met	86.32	80.06,92.59	4.84	2.58,9.05	<0.001	88.89	81.57,96.21	4.65	2.11,10.23	<0.001
Knew each other	74.45	67.11,81.79	2.23	1.34,3.73	0.002	89.52	83.63,95.42	4.97	2.50,9.87	<0.001
Steady relationship	56.62	48.24,64.99	1			63.24	56.59,69.88	1		
Prostitute/'other'	88.24	62.05,97.18	5.75	1.26,26.12	0.024	.	.	.	.	.
Relationship continued after sex?										
Yes, still together	51.02	36.86,65/18	0.51	0.27,0.96	0.038	39.34	26.96,51.72	0.18	0.10,0.33	<0.001
No, did not continue	84.05	78.40,89.70	2.57	1.53,4.32	<0.001	91.84	86.38,97.29	3.14	1.42,6.92	0.005
Did continue, not still together	67.2	60.47,73.92	1			78.18	72.7,83.66	1		

Table 30 presents the proportions of men and women who were not sexually competent at first sex by key variables, along with the corresponding crude odds ratios. Among women, having no education was associated with sexual non-competence at first sex, whereas among men, no significant association between education and sexual competence was observed. Male respondents of high socio-economic status were less likely to have been non-competent at first sex compared with men of low socio-economic status – among women a similar relationship was observed but it was of borderline statistical significance ($p=0.065$).

Men and women who were under 16 at first sex were two to three times more likely to have been sexually non-competent at first sex, compared with those who were 16 or older (ORs: 2.08 and 3.63, respectively).

Women who reported that it was also their partner's first time were less likely to be sexually non-competent at first sex (OR: 0.36), while those who reported that they were 'unsure' whether it was their partner's first time too were more likely to be categorised as sexually non-competent (OR:3.03). No such association was observed among men.

The associations observed between sexual competence and relationship status, extent of planning, and continuation of relationship after first sex, are described below.

Table 31: Logistic regression analyses of association between sexual non-competence and relationship status at first sex, relationship continuation after first sex, and planning of first sex (Women)

	UNADJUSTED ANALYSIS			MULIVARIABLE ANALYSES								
WOMEN OUTCOME: Not sexually competent	Crude OR	p-value	95% CI	AOR	p-value	95% CI	AOR	p-value	95% CI	AOR	p-value	95% CI
Relationship status												
Just/recently met	4.65	<0.001	2.11,10.23	3.73	0.003	1.56,8.93	3.05	0.009	1.32,7.02	2.57	0.040	1.04,6.32
Knew each other	4.97	<0.001	2.50,9.87	3.58	0.001	1.72,7.46	3.6	<0.001	1.76,7.36	2.74	0.008	1.30,5.80
Steady relationship	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Prostitute/'other'	.	.	.	.	.	.	.	.	.	.	.	.
Relationship continued after sex?												
Yes, still together	0.18	<0.001	0.10,0.33	0.18	<0.001	0.10,0.34				0.21	<0.001	0.11,0.42
No, did not continue	3.14	0.005	1.42,6.92	1.78	0.185	0.76,4.15				1.87	0.156	0.79,4.46
Did continue, not still together	1 (ref)			1 (ref)						1 (ref)	.	1.00,1.00
Planning of first time												
Spur of the moment	1 (ref)						1 (ref)			1 (ref)		
Expected then/soon	0.29	0.001	0.14,0.60				0.42	0.027	0.20,0.91	0.53	0.116	0.24,1.17
Planned	0.09	<0.001	0.04,0.21				0.14	<0.001	0.06,0.33	0.17	<0.001	0.07,0.41
Can't remember	1.42	0.749	0.17,11.85				2.00	0.528	0.23,17.33	2.08	0.522	0.22,19.39

Table 32: Logistic regression analyses of association between sexual non-competence and relationship status at first sex, relationship continuation after first sex, and planning of first sex (Men)

	UNADJUSTED ANALYSIS			MULTIVARIABLES ANALYSES								
MEN OUTCOME: Not sexually competent	Crude OR	p-value	95% CI	AOR	p-value	95% CI	AOR	p-value	95% CI	AOR	p-value	95% CI
Relationship status												
Just/recently met	4.84	<0.001	2.58,9.05	3.22	0.001	1.60,6.49	3.64	<0.001	1.88,7.04	2.8	0.005	1.37,5.76
Knew each other	2.23	0.002	1.34,3.73	1.56	0.125	0.88,2.76	1.73	0.051	1.00,3.00	1.36	0.309	0.75,2.46
Dating/living together/married	1 (ref)			1 (ref)			1 (ref)			1 (ref)		
Prostitute/'other'	5.75	0.024	1.26,26.12	3.34	0.137	0.68,16.37	4.84	0.044	1.04,22.47	3.29	0.147	0.66,16.39
Relationship continued after sex?												
Yes, still together	0.51	0.038	0.27,0.96	0.58	0.109	0.30,1.13				0.63	0.185	0.32,1.24
No, did not continue	2.57	<0.001	1.53,4.32	1.65	0.098	0.91,2.97				1.37	0.318	0.74,2.54
Did continue, not still together	1 (ref)			1 (ref)						1 (ref)		
Planning of first time												
Spur of the moment	1 (ref)						1 (ref)			1 (ref)		
Expected then/soon	0.42	0.001	0.25,0.69				0.52	0.017	0.31,0.89	0.57	0.047	0.33,0.99
Planned	0.26	0.000	0.14,0.50				0.41	0.014	0.20,0.83	0.44	0.030	0.21,0.93
Can't remember	0.86	0.768	0.33,2.27				1.07	0.900	0.40,2.87	1.04	0.933	0.38,2.86

Table 31 presents the logistic regression analyses exploring the association between sexual competence and relationship status as first sex, continuation of the relationship after first sex, and planning/expectation of first sex among female respondents. In the crude analysis (first column), relationship status was highly associated with sexual competence at first sex. Compared with those who were in a steady relationship, respondents who reported that they had just/recently met their partner or that they knew each other, but were not dating were almost five times more likely to have been not sexually competent at first sex (OR: 4.65 and 4.97, respectively). Once adjusted for the variable relating to the continuation of the relationship after first sex, the association between relationship status and sexual competence reduced slightly, with adjusted odds ratios of 3.73 and 3.58, respectively. When the variable of planning/expectation of first sex was also introduced into the model as a covariate, the magnitude of association between relationship status and sexual competence decreased further, to adjusted odds ratios of 2.57 and 2.74, respectively.

The crude association between sexual competence and continuation of the relationship after first sex was statistically significant; compared to those whose relationship did continue, but were not still together, participants who were still with their first sexual partner at age 21 were far less likely to have been non-competent at first sex (OR: 0.18), whereas those who reported that their relationship had not continued for any period of time were over 3 times more likely to have been not sexually competent at first sex (OR: 3.14). When adjusting for the effect of relationship status, there was no longer a statistically significant association between not still being together with one's first partner and sexual competence at first sex – whereas the association with the 'still together' category was retained. These odds ratios did not change again with the addition of planning/expectation of first sex to the model.

Planning/expectation of first sex was also associated with sexual competence – compared with those who reported that it was a 'spur of the moment' decision, those who had expected sex to happen then/soon or those who had 'planned' to have sex were significantly less likely to have been not sexually competent at first sex (ORs: 0.29 and 0.09, respectively). The association between 'expected then/soon' and sexual competence reduces slightly with the addition relationship status to the regression model (AOR: 0.42). When the variable relating to the continuation of the relationship after sex is also added to the model, the 'expected then/soon' category is no longer significantly associated with sexual competence, while having 'planned' first sex continues to be highly associated with sexual competence.

Table 32 presents the equivalent regression analyses among male respondents. As was found among women, relationship status at first sex was significantly associated with sexual competence – compared with those who were in a steady relationship, those who had

just/recently met were over four times more likely to have been not sexually competent at first sex (OR: 4.84), while those who 'knew each other' but were not together were over twice as likely to have been sexually non-competent at first sex (OR: 2.23). However, once the variable relating to the continuation of the relationship after first sex was introduced to the regression model, the association between sexual competence and the 'just/recently met' category is reduced (AOR: 3.22), while the association between the 'knew each other, but not together' category and sexual competence is reduced to statistical non-significance. With the addition of the planning/expectation of first sex variable, the association between sexual non-competence and the recently/just met category is decreased slightly further to an adjusted odds ratio of 2.8.

Whether the relationship continued after first sex was associated with sexual competence among men – compared with participants who reported that the relationship continued, but were not still together, those who were still together were less likely to have been sexually non-competent at first sex (OR: 0.51) and those whose relationship did not continue were over twice as likely to have been not sexually competent at first sex (OR: 2.57). However, when relationship status at first sex was added to the model, the association between relationship continuation and sexual competence was reduced to non-significance.

Compared with male participants who reported that their first sex was a 'spur of the moment' decision, those who expected it then/soon or had planned to have sex, were significantly less likely to have been sexually non-competent at first sex (OR: 0.42 and 0.26, respectively). When adjusting for relationship status at first sex, these associations decreased slightly (AORs: 0.52 and 0.41, respectively) – with no further substantial changes on the addition of the continuation of the relationship after first sex variable to the model.

7.2.4 Discussion

Compared to the Natsal-3, this study took place in a different country, and participants were from an older cohort (age 21 in the early 1990s) and had a lower rate of 'sexual competence' at first sex. Despite this, the findings based on analyses using comparable variables are broadly consistent with those presented in the previous section using Natsal-3 data; with sexual competence at first sex associated with social class, educational level, age at first sex, partner's virginity status, and relationship status at first sex.

The main aim of these analyses was to elucidate the associations that exist between sexual competence at sexual debut and relationship status at first sex, with reference to whether the relationship continued after first sex, and whether first intercourse was planned/expected.

Among female participants, the analyses indicate that the association between relationship status at first sex and sexual competence is partially due to the fact that individuals who were not in a steady relationship with their partner were less likely to have continued their relationship after first sex. Additionally, the degree of planning for first sex also seems to account for part of the association between relationship status and sexual competence, as those who were not in a steady relationship at first sex were more likely to have reported that their first sex was a spur of the moment decision. However, even when adjusting for these two variables, relationship status retains a statistically significant (albeit smaller in magnitude) association with sexual competence, suggesting that the effect of relationship status is not only due to what happened to the relationship after sex nor the degree of planning.

Among men, a similar pattern was observed, whereby the association between sexual competence and relationship status at first sex appears to be partially due to the effect of the continuation of the relationship after first sex, as well as the degree of planning for first sex reported. In the final adjusted model, only those who reported that they had 'just/recently' met their partner were significantly more likely to have been sexually non-competent at first – indicating that having had no prior knowledge of their sexual partner was the most important relationship status determinant of sexual non-competence.

As discussed in the previous section, the status of the partnership has been found to influence the nature of the first sexual experience in previous research (Wight et al., 2008; Henderson et al., 2002; Layte and McGee, 2007; Smiler et al., 2005).

With regard to the importance of the relationship *after* first sex and its association with sexual competence, once adjusted for relationship status and degree of planning, only women who were *still* with their first sexual partner were significantly less likely to be sexually non-competent at first sex, compared to those whose relationship continued, but were not still together. This suggests that those who are still in a relationship with their first sexual partner at age 21 may be more likely to assess their first sexual intercourse favourably, and therefore are more likely to be classified as sexually competent. In the adjusted analyses, participants whose relationship continued, but were not still together at age 21 were no more or less likely to be categorised as 'sexually competent' than those whose relationship did not continue for any period of time. This suggests that although what happened after the event is important, it is only still being together with that first partner that maintains a positive association with sexual competence. While this might be due to the positive effect a sexually competent first sexual experience may have on the partnership and so the relationship continues, it may also be that people consider their current partner positively – which also colours the way they evaluate their first sexual intercourse with that partner.

Once adjusted for the effect of relationship status at first sex, whether or not the relationship had continued after first sex was no longer statistically significantly associated with sexual competence among men – indicating that the crude association observed with this variable was actually due to the prior relationship status at first sex. This finding suggests that what happened to the relationship after first sex may be less important in how young men frame and assess their experience of first sex – perhaps due to the reported gendered differences in response to sexual encounters whereby men are more concerned with the physical experience, rather than the relational and emotional (Else-Quest et al., 2005).

Despite the retrospective and highly interpretive nature of the sexual competence measure, what happened to the relationship *after* first sex was not as important for participants' sexual competence status as were the variables relating to relationship status and planning. No other studies concerned with association between the experience of first sex and what happened to the relationship after first sex were identified. Though in a qualitative study of British youth, a number of female respondents reported regret about their first sex intercourse which seemed to stem from the "contrast between reality and prior intention among many women that first intercourse would be in the context of a stable and romantic relationship" – some of these participants reported that they believed they were in such a relationship at the time of sexual debut, "but had realised after the event that they were mistaken" (Ingham et al., 1991) (p. 128).

When relationship status and relationship continuation were adjusted for in the model, the only category of the planning variable to retain a statistically significant association with sexual competence among women was that which referred to the first sex having been 'planned'. In the final model for male respondents, the degree of planning ('expected' and 'planned' categories) for sex retained a significant association with sexual competence at first, though slightly lower in magnitude compared with the crude association observed. Planning may be associated with partner communication, in which sexual wishes and intentions are shared, so that when sex does occur, it is negotiated to fairly represent each partners' wants and needs.

As discussed in the previous section, the association between the degree of expectation/planning and the experience of first sex is in accordance with previous literature (Smiler et al., 2005; Henderson et al., 2002; Layte and McGee, 2007).

7.2.5 Conclusions and Implications

The three factors explored in these analyses are associated with each other and appear to partially or wholly confound one another's association with sexual competence. As hypothesised, the continuation of the relationship after first sex and the degree of expectation/planning for both sexes both account for a portion of the association observed

between relationship status at first sex and sexual competence. However, relationship status does retain an independent association with sexual competence, suggesting that relationship status in itself is an important correlate of sexual competence at sexual debut.

Using data from the Dunedin Multidisciplinary Health and Development Study, these analyses confirm and elucidate the findings presented in the previous section of this chapter concerned with 'predictors' of sexual competence. Along with replication of the finding that a more 'steady' relationship is positively associated with sexual competence at first intercourse, the degree of planning/expectation for first sex is also shown to be an important correlate of sexual competence. All of these questions were asked retrospectively within the same interview at age 21, meaning that any inference of causality must be considered with great caution. Though it is possible that stable relationship enables a safer environment where by a positive sexual encounter can be experienced, while the degree of 'planning' indicates negotiation prior to the first sexual encounter, which encourages both partners' sexual wishes and boundaries to be mutually respected.

7.3 Summary of Chapter 7

- **The sexual competence measure is associated with age at first sex, and other antecedent variables, in the direction expected, providing evidence for the external-criterion validity of the measure.**
- **Age at first sex does not explain all variation in competence, providing empirical evidence that chronological age alone is an overly simplistic indicator of the nature and appropriateness of the onset of sexual activity.**
- **The associations observed between sexual competence and the antecedent variables were retained when adjusting for age at first sex, suggesting that the measure of sexual competence is not simply a function of age.**
- **Relationship status at first intercourse is highly associated with sexual competence – and this association retains significance even when adjusting for continuation of the relationship subsequent to first sex and the degree of planning for first sex.**

8. Chapter 8: Is sexual competence at first intercourse associated with subsequent sexual health status?

8.1 SECTION 1: Is sexual competence associated with subsequent sexual health?

8.1.1 *Introduction*

Associations have been found between age at first sex and adverse sexual health later in life; those who engage in sexual intercourse at younger ages have been found to be at higher risk of STIs (Kahn et al., 2002a; Kaestle et al., 2005; Eberhart-Phillips et al., 2001), early motherhood and abortion before 18 (Wellings et al., 2001), and engaging in sexual-risk behaviours (de Sanjose et al., 2008; Santelli et al., 1997; Humblet et al., 2003; Svare et al., 1997). These associations are commonly cited as a justification for research that focuses on predictors of 'early' first sex. However, it has been argued that chronological age is an overly crude measure of the nature and appropriateness of first sexual intercourse; older age alone does not necessarily safeguard sexual health status. Furthermore, existing research has found that negative psycho-social conditions of first intercourse are associated with subsequent adverse sexual health (Else-Quest et al., 2005; Reissing et al., 2012; Smith and Shaffer, 2013).

In an attempt to provide a more nuanced measure of the onset of sexual activity, a measure of 'sexual competence' at first sex was developed using data from second British National Survey of Sexual Attitudes and Lifestyles (Natsal-2) (Wellings et al., 2001). This measure, made up of respondents' self-reports regarding the circumstances of their first heterosexual intercourse, aims to provide a more holistic assessment of the sexual encounter based on physical, social, and emotional dimensions of health, in accordance with the definition of sexual health endorsed by the WHO (WHO, 2006). Natsal respondents were classified as having been 'sexually competent' at sexual debut if they endorsed the following four items: contraceptive protection, autonomy of decision (not due to external influences such as peer pressure or alcohol), equal willingness of both partners, and acceptable timing (that it happened at the 'right time').

The current chapter

This chapter presents analyses using data from Natsal-3 to explore whether 'sexual competence' at sexual debut is associated with subsequent sexual health in a population-based sample of British 16-24 year olds.

Just as the measure of sexual competence at sexual debut aims to provide a more comprehensive measure of the experience of the first sexual encounter, including not only protection against STIs and unintended pregnancy, but also more emotional and social aspects

concerned with willingness and regret, the outcomes of interest in this study are also framed within a broader vision of sexual health, informed by the definition endorsed by the World Health Organization (WHO):

“Sexual health is a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected and fulfilled.” (WHO, 2006)

Measures of STI acquisition and unplanned pregnancies are used in this analysis to indicate the physical state of health of respondents, while a measure of sexual function accounts not only for physiological functioning, but also taps into emotional well-being and satisfaction, as well as physical pleasure derived from sexual activity. Finally the experience of non-volitional sexual intercourse is studied in order to account for the requirement of sexual health to be free of coercion and violence.

Therefore, the aims of this chapter are to determine whether sexual (non-)competence at sexual debut is associated with subsequent sexual health outcomes, notably:

- Self-reported STI diagnosis
- Testing positive for HPV at interview
- Low sexual functioning
- Unplanned pregnancy
- Non-volitional sex

By controlling for multiple explanatory factors, the following analyses also explore whether any associations identified between sexual competence and sexual health occur independently of potential confounders. The results of these analyses are important in evaluating whether the sexual competence measure demonstrates external-criterion validity. Given that the measure of sexual competence seeks to tap into a range of criteria deemed necessary for sexual health as defined by the WHO, an association with other measures of sexual health may provide evidence for its external criterion validity. Moreover, the results of these analyses have implications for the utility of the measure of sexual competence in future research and public health efforts, in terms of whether it can be used to identify young people who are at greater risk of poor sexual health. The findings are also of public health relevance in terms of enhancing our understanding of whether and how the experience of first sexual intercourse relates to subsequent sexual health status.

8.1.2 Methods

Participants

Data from the Third National Study of Sexual Attitudes and Lifestyles (Natsal-3) were analysed. Natsal-3 is a stratified probability sample survey of 15,162 men and women aged 16-74 and resident in Britain. The sampling strategy included a 'boost' of 16-34 year olds, resulting in data being collected from 3689 participants aged 16-24 at interview (Erens et al., 2013). Participants were interviewed in 2010 - 2012 using a combination of face-to-face, computed-assisted personal interviews and computer-assisted self-interviews.

Measures

Measure of sexual competence

Natsal-3 participants were asked about their age and experience of first heterosexual intercourse using show cards in the face-to-face component of the interview. Where respondents reported that they first had sexual intercourse at 12 years old or younger (n=46), the questions relating to the circumstances and experience of first sex were asked about their first sexual intercourse since turning 13. This was with the aim of avoiding probing questions about early sexual encounters which may have been non-consensual, and was required for ethical approval. Questions concerning the experience of first intercourse sought to measure whether partners were both equally willing to engage in sexual intercourse, whether the decision to have sex was autonomous (not due to factors external to the self, such as peer pressure or drunkenness), whether the respondent felt their first sexual encounter had happened at the 'right' time, and whether a reliable method of contraception had been used (contraceptive pill or condom). The sexual competence measure under focus in this study was retrospectively constructed using self-reports of the above four measures; a respondent is classified as sexually competent at first intercourse if the encounter was characterised by equal willingness of partners, autonomy of decision, that it happened at the right time, and a reliable method of contraception was used. Respondents who endorsed fewer than all four of these items were categorised as non-competent at first sex.

Outcomes of interest

For the STI outcomes, two measures were used; one based on self-reports whereby participants answered the question, "Have you ever been told by a doctor or other healthcare professional that you had any of the following?", which was followed by a comprehensive list of STIs. The

other was based on urine tests that were conducted on a subsample of the larger Natsal-3 sample. This subsample of participants was asked whether they would be willing to provide a urine sample. The urine was tested for several STIs, including Chlamydia, Gonorrhoea, HPV, and HIV, which could be linked back to the participant ID number. Due to the limited number of respondents testing positive for bacterial STIs, only the results of the HPV testing was used as an outcome measure.

To measure the experience of non-volitional sex, respondents were asked, “since the age of 13, has anyone tried to make you have sex with them, against your will?”, those who answered ‘yes’ to this were asked the follow up question, “And since the age of 13, has anyone actually made you have sex with them, against your will?”. Respondents who answered ‘yes’ to this second question were coded as having experienced non-volitional sex.

While the self-reported STIs and non-volitional sex outcomes were measured through single questions asking whether these events had ever occurred, sexual functioning and unplanned pregnancy were measured using psychometrically validated instruments.

Sexual functioning was measured using a questionnaire instrument that was developed and psychometrically validated for the measurement of sexual function in community surveys (Mitchell et al., 2012). The 17-item Natsal-SF asks participants about their experience of specific sexual problems and the level of general satisfaction and distress with their sex life, in the last year. Based on the best-fitting confirmatory factor analysis model, sexual function scores for each participant reporting sexual activity in the year prior to interview were derived, with a ‘case’ of low sexual functioning being categorised as a score within the lowest quintile, equating to 20% of the sample being classified as having experienced sexual dysfunction in the past year (Mitchell et al., 2013).

Unplanned pregnancy was measured using the London Measure of Unplanned Pregnancy (LMUP) (Barrett et al., 2004). This psychometrically validated instrument consists of six questions which aim to cover six thematic areas of the circumstances in which a female respondent became pregnant in the last year: 1) expressed intentions; 2) desire for motherhood; 3) contraceptive use; 4) pre-conceptual preparations; 5) personal circumstances/timing; and 6) partner influences (Barrett et al, 2004, p. 428). The instrument scores pregnancies on a scale of 0-12, with higher scores indicating higher degrees of ‘planning’ for the pregnancy. In prior testing, this measure successfully differentiates between pregnancies that end in abortion and those that are continued to term (abortion is known to be a much more likely outcome when the pregnancy was not planned). Barrett et al (2004) provide guidelines for the interpretation of scores as categories. Scores of 0-3 are classified as an ‘unplanned’ pregnancy, respondents

scored 4-9 are considered to have been 'ambivalent', while respondents with scores of 10-12 are categorised as having had a 'planned' (or 'highly planned') pregnancy. In Natsal-3, the LMUP question module was asked of women who had been pregnant in the year before interview and, where more than one pregnancy had occurred, in relation to the most recent event. We examined the odds of having had an unplanned pregnancy, versus a pregnancy that was not unplanned or no pregnancy in last year. While this research does not intend to imply that an unplanned pregnancy is a negative outcome per se, there are potential less-than-optimal consequences. Unplanned pregnancies are more likely to end in abortion, and those that do carry financial cost to the healthcare system, as well as potential personal/emotional risk to the individual women. Those women who continued their pregnancy to term will have had fewer opportunities to benefit from pre-conception care, such as taking folic acid and giving up smoking. Barrett's (2002) second field test of the measure among 651 pregnant/recently pregnant women found that of those who scored 0-3, indicating that the pregnancy was unplanned, 76% of these conceptions ended in abortion, compared to just 2.8% of the pregnancies which scored 4 or more on the LMUP scale.

Sample restriction

For the purpose of this research, analysis has been restricted to sexually active respondents aged 16-24 years at interview in order that the results are applicable to the contemporary young population of Britain who transitioned into sexual activity around or since the turn of the millennium, and therefore will have been subject to similar social and cultural norms surrounding first sex. This age group are also of particular public health relevance as they are more likely to be engaging in transient sexual relationships and are at greatest risk of poor sexual health, such as STIs (Public Health England, 2012).

The restriction of the sample to respondents aged 16-24 who had ever had heterosexual intercourse will mean that, overall, there is an over-representation of respondents who have had sex at younger ages, which is associated with sexual non-competence (Chapter 7) and other indicators of poor sexual health. This should be noted when interpreting the prevalence of key variables among this sample. However, one would not expect the associations between sexual competence and the outcomes of interest to be biased within this sample. It is possible that within this age range a degree of attenuation of any associations between sexual non-competence at first sex and certain outcomes may occur – the risk of experiencing STIs and pregnancy increases with duration sexually active, so that a 16 year old may have been more likely to have been non-competent at first sex, but less likely to have experienced an STI or pregnancy due to reduced time 'at risk'. The adjustment for duration sexually active in the final model will go some way to overcome this. Furthermore, extra analyses were conducted whereby

the regression analyses were repeated among those aged 18-24 at interview (by 18, ~80% of respondents reported experience of heterosexual intercourse, meaning that among the 18-24 year old sample, almost 90% were sexually active) (results shown in Appendix 7).

Respondents reporting that their partner was 'more willing' at first sex were filtered through to additional question asking whether they were 'forced'. Those who reported that their first sexual intercourse was 'forced' were dropped from the all analyses (n=23, 6.6% of respondents who reported that their partner had been 'more willing'). It was reasoned that a respondent who has been classified as not sexually competent because their first sex was forced is likely had a substantially different experience to those who were categorised as not sexually competent due to a less extreme reason. Therefore, it was felt that including those who were forced as not competent was inappropriate, and could have biased results towards greater associations between non-competence and subsequent sexual health indicators – particularly low sexual function.

Specific restrictions to the sample were also made for analyses using particular outcomes. Where the experience of non-volitional sex was the outcome of interest, those who reported that the last occasion of non-volitional sex occurred at an age that was younger than their reported consensual sexual debut, were excluded from analyses, as the sexual encounter at which sexual competence was or was not demonstrated must precede the occasion of non-volitional sex to be a true predictor. Non-volitional sex was only used as an outcome for female participants, as only 14 male respondents reported having experienced forced sex.

In analyses using unplanned pregnancy as the outcome, the female sample was restricted so that only pregnancies with known outcome were included, i.e. those who were still currently pregnant were excluded from analyses in order to avoid over-representing pregnancies that resulted in birth.

Covariates

The selection of covariates included in the final multivariable models was informed by the analyses in chapter 7, identifying the predictors of sexual competence at sexual debut, and the sexual health literature, with the aim of adjusting for any potential confounders that may explain any association observed between sexual (non-)competence at first sex and indicators of subsequent sexual health.

Of particular interest was the role of age at first sex, with attention given to the cut-off defining 'early' sex used in the majority of literature concerned with timing of sexual debut, that is, whether it occurred before the age of consent: 16 years old. From chapter 7, and analyses of Natsal-2 data (Wellings et al., 2001), we know that younger ages at sexual debut are associated with greater likelihood of sexual non-competence, while numerous studies have found younger age at first sex to be associated with poorer sexual health later in life (Kahn et al., 2002a; Kaestle et al., 2005; Eberhart-Phillips et al., 2001; Wellings et al., 2001).

Additional covariates were selected based on their availability, with the aim of providing a representation of factors in childhood and adolescence which could hypothetically confound any relationship identified between sexual competence at sexual debut and subsequent sexual health. Three indicators relating to socio-economic status were explored: the Index of Multiple Deprivation quintiles - indicative of the local environment in which the respondent lives; parental social class – representing the status of the family unit in which the participant grew up; and finally, educational level of the participant – providing an indicator of the socio-economic position of the respondent her/himself. Ethnicity of the participants and their family structure at age 14 provide further cultural and contextual information on the respondents' developmental influences. Two variables relating to learning about sex, which potentially have a more direct influence on sexual behaviour, were examined – one asked respondents to identify their 'main' source of sex education, and the other asked respondents to report the level/difficulty in discussing sex with their parents during their teenage years. Where categories of certain variables contained only respondents who had or had not experienced the outcome of interest (i.e. were 'perfect predictors', the number of categories within that variable was reduced to prevent respondents being dropped out of the multivariable regression models. Specifically, the ease discussing sexual matters with parents at 14 variable was collapsed into a binary 'did discuss' or 'did not discuss' for the HPV outcome among males and the unplanned pregnancy outcome among women. The ethnicity variable categories were also collapsed into 'White' versus 'non-White' for the unplanned pregnancy outcome.

The duration for which a person has been sexually active influences their risk of experiencing certain sexual health outcomes due to increased time 'at risk'. Although this variable cannot be considered as a true confounder, it was added to the final models to assess whether it explained any portion of the associations observed between sexual competence, age at first sex, and the outcomes of interest.

Statistical analysis

The first stages of the analysis involved examining how the prevalence of each of the outcomes of interest varied by characteristics relating to socio-demographics, family factors, and aspects relating to the experiences of first sexual intercourse, including sexual competence, i.e. the variables which were subsequently introduced into the multivariable regression models as explanatory variables.

Multivariable logistic regression was employed to determine whether sexual competence at sexual debut was independently associated with each indicator of sexual health, when adjusting for the effects of other theoretically related variables. The aim of the following analyses was not to build the most parsimonious predictive or diagnostic model for the prediction of each of the outcomes under study, but to examine whether sexual competence at first sex was associated with the selected sexual health outcomes, independently of whether sexual debut occurred before the age of 16, and other potential confounding factors. Therefore the 'all variable' approach was used, whereby all the variables which were theorized or shown in previous research to be potentially confounding factors were entered into the model, in order that the resulting estimates are adjusted for all potential (measured) confounders and the associations between them, thus minimising the possibility of missing important changes in coefficients caused by a modest confounder (Katz, 2011). This approach to regression modelling whereby greater emphasis is placed on prior knowledge and previous research in selecting the confounders ('external evidence'), rather than solely focusing on those covariates which have been shown in the current dataset to be statistically associated with the exposure and outcomes variables ('internal evidence') is widely recommended as the appropriate strategy when the goal of the study is to assess the relationship between a single exposure and outcomes of interest (McNamee, 2003; Robins, 2001; Hernán et al., 2002).

However, problems can occur when adjusting for a large number of covariates, resulting in biased estimates and unreliable confidence intervals due to the large number of parameters in the model (Cousens et al., 2009). Therefore, in order to assess whether the results of the 'all-variable' multivariable regression analyses were robust, additional regression analyses involving a more parsimonious model for each outcome were conducted, including only those variables associated with the exposure and outcome (defined by a less restrictive p-value of <0.2-0.3). The adjusted odds ratios estimated by the more parsimonious models (shown in Appendix 8) barely differed from those calculated using the 'all variable' models.

Covariates were added into the regression model in predefined thematic groups in a stepwise fashion in order that if any change in the association between sexual competence and the outcomes was observed, the confounding variables that accounted for this could be identified. The results of four regression models for each outcome are shown in the results section. Model

1 includes both sexual competence and age at first sex as predictor variables, allowing the assessment of each variable's independent predictive effect on the outcome of interest. Model 2 introduces multiple 'background' variables into the model: IMD quintile of residence, parental social class, educational level of respondent, family structure at age 14, and ethnicity. Model 3 is the same as model 2, with the addition of two variables tapping into the respondents' learning about sex: the ease with which the respondent had discussed sexual matters with their parent(s) at age 14, and their main source of sex education. The final Model 5 also includes the duration sexually active variable.

Analyses assessing the outcomes of self-reported STIs, testing positive for HPV infection, and low sexual functioning were carried out separately for men and women to allow for identification of gender differences. The outcomes of unplanned pregnancy and non-volitional sex were assessed among female respondents only. Multivariable regression analyses were performed on complete cases in order to ensure comparability of adjusted odds ratios across models for each outcome. Statistical analysis was conducted using the Stata (Version 13) survey commands, in order to account for the weighting, clustering, and stratification of the survey data. The HPV urine test data had specific weights which corrected for unequal probabilities of urine-sample collection and differential sample response, therefore, any analyses using the HPV urine test data account for this specific weighting variable (Erens et al., 2013).

In order to assess whether any association observed between sexual competence and subsequent sexual health differed according to whether sexual debut occurred before or after 16, interaction terms between these two variables were added to the models. No evidence of an interaction was identified, with p-values >0.6, and so the models without interaction terms are presented.

As described above, alternate analyses were conducted in order to assess the robustness of the results shown in this chapter. The multivariable logistic regression analyses were repeated as follows:

1. Same multivariable analysis as presented in this chapter, but limited to 18-24 year olds (Appendix 7)
2. More parsimonious models, including only those variables associated with the exposure and outcome (defined by a less restrictive p-value of <0.2-0.3), among 16-24 year olds (Appendix 8)

8.1.3 Results

STIs (self-reported)

Table 33 presents the prevalence of self-reported STIs among the 16-24 year old respondents who have ever had sexual intercourse, by a series of factors. A significantly higher proportion of women reported ever having had an STI (19.0%) compared to men (8.5%). Among both men and women, higher STI rates are reported among respondents whose sexual debut occurred at age 15 or younger, who left school at age 16, whose main source of sex education was 'friends', and who had been sexually active longer. Not living with both parents until the age of 14, and black ethnicity were statistically significantly associated with higher self-reported STIs among female participants only. Of particular note among female respondents, having been not sexually competent at first sex was associated with 1.83 greater odds of having had an STI, compared to those who were sexually competent at first sex.

Table 34 shows the results of the multivariable logistic regression among female respondents with the outcome of ever having had an STI. In the first model, including only the two variables relating to sexual competence and age at first sex, both having been not sexually competent, and having had first sex before 16 were independently associated with having ever had an STI (AOR: 1.66 and AOR: 1.51, respectively). The slight attenuation in the strength of the association between sexual competence, sex before 16, and STIs, suggests some mutual confounding between these two explanatory variables. These two independently significant associations remained with the addition of IMD quintile, educational level, parental social class, family structure, ethnicity, ease of discussion about sex with parents, main source of sex education, to the model. However, on introducing the variable 'duration sexually active' to the model, the predictive effect of sex before 16 disappeared (AOR: 1.06, $p=0.742$), while the sexual competence measure remained statistically significantly associated with self-reported STIs (AOR: 1.41).

Table 35 presents the same multivariable logistic models for male respondents. The association between sexual competence and STIs does not reach statistical significance in any of the multivariable models. Male respondents who had sex before they were 16 years old had twice the odds of having had an STI, compared those whose sexual debut occurred later (AOR: 2.05) and this significant relationship was retained until the duration of sexually activity was added to the model.

Table 33: Proportions and unadjusted odds ratios of Natsal-3 respondents aged 16-24 at interview who report ever diagnosis of an STI, by gender and explanatory variables.

	Men					Women					N (unweighted/weighted)
	%	95% CI	OR	95% CI	p-value	%	95% CI	OR	95% CI	p-value	
ALL	8.53	6.97,10.4				19.0	16.9,21.4				2964/1883.66
Sexual competence											
Competent	7.23	(5.33- 9.74)	1			14.31	(11.72- 17.37)	1			1525/989.18
Non-competent	10.09	(7.63- 13.22)	1.44	0.92,2.26	0.113	23.44	(20.25- 26.96)	1.83	1.37,2.46	<0.001	1428/887.81
Age at first sex											
First sex ≥16	6.23	(4.60- 8.39)	1			15.85	(13.12- 19.01)	1			1762/1173.98
First sex ≤15	12.18	(9.32- 15.76)	2.09	1.35,3.23	0.001	24.49	(21.21- 28.09)	1.72	1.29,2.30	<0.001	1202/709.68
IMD quintile											
1: least deprived	6.23	(3.68- 10.35)	1	.	.	15.56	(11.43- 20.82)	1			502/322.78
2	8.87	(5.77- 13.41)	1.47	0.72,2.97	0.288	16.92	(12.55- 22.43)	1.11	0.67,1.82	0.693	549/351.91
3	9.03	(5.60- 14.23)	1.49	0.70,3.18	0.298	19.00	(14.57- 24.39)	1.27	0.79,2.05	0.32	560/358.14
4	8.00	(4.98- 12.63)	1.31	0.62,2.79	0.484	20.05	(15.69- 25.26)	1.36	0.86,2.16	0.192	640/433.86
5: most deprived	10.24	(6.96- 14.83)	1.72	0.86,3.45	0.128	22.22	(17.56- 27.71)	1.55	0.97,2.47	0.064	713/416.97
Parental social class											
No response	9.21	(5.00- 16.37)	1.10	0.54,2.22	0.800	18.55	(12.86- 26.00)	1.04	0.65,1.67	0.864	311/188.92
Manual iv/v	6.97	(4.18- 11.39)	0.81	0.44,1.47	0.488	21.21	(16.43- 26.92)	1.23	0.86,1.77	0.258	548/330.98
Non-manual i/ii/iii	8.48	(6.63- 10.77)	1	.	.	17.93	(15.37- 20.82)	1			2002/1310.62
Educational level											
Left school at 16 no qualifications	11.75	(5.56- 23.17)	1.58	0.67,3.76	0.297	30.94	(22.05- 41.51)	2.03	1.24,3.32	0.005	154/ 83.85
Left school at 16 with qualifications	12.6	(8.65- 18.01)	1.71	1.04,2.82	0.033	25.05	(20.04- 30.82)	1.51	1.08,2.12	0.017	556/325.46
Left school 17+ with qualifications	7.76	(6.02- 9.96)	1	1.00,1.00	.	18.11	(15.57- 20.95)	1	1.00,1.00	.	2055/1363.77
Currently 16	2.77	(0.60- 11.87)	0.34	0.07,1.64	0.178	3.13	(0.96- 9.74)	0.15	0.04,0.50	0.002	193/106.84
Ethnic group											
White	8.36	(6.74- 10.32)	1	.	.	18.32	(16.18- 20.66)	1	.	.	2659/1662.14
Mixed	5.50	(1.72- 16.19)	0.64	0.19,2.17	0.472	27.72	(16.37- 42.91)	1.71	0.86,3.40	0.126	108/ 65.33
Asian, Chinese, Other	9.32	(3.87- 20.78)	1.13	0.43,2.96	0.808	6.61	(2.13- 18.76)	0.32	0.10,1.04	0.059	116/ 93.71
Black	15.34	(5.36- 36.69)	1.99	0.61,6.50	0.256	42.67	(25.52- 61.78)	3.32	1.52,7.27	0.003	79/ 61.42
Family Structure at 14											
Lived with both parents until 14	8.53	(6.63- 10.91)	1			16.83	(14.33- 19.66)	1			1855/1259.04
One/neither parent	8.55	(6.13- 11.81)	1.00	0.64,1.58	0.987	22.47	(19.06- 26.29)	1.43	1.09,1.88	0.009	1108/623.37

Main source of sex education											
Parents	8.81	(3.93- 18.57)	1.42	0.55,3.67	0.468	15.96	(11.82- 21.19)	1.05	0.68,1.61	0.835	344/207.63
School	6.37	(4.33- 9.28)	1	.	.	15.36	(12.37- 18.91)	1	.	.	1053/674.00
Friends	11.32	(7.99- 15.79)	1.88	1.07,3.28	0.027	21.85	(17.72- 26.62)	1.54	1.08,2.19	0.017	782/484.20
Other	8.83	(6.24- 12.34)	1.42	0.82,2.48	0.212	24.05	(19.19- 29.70)	1.75	1.20,2.55	0.004	771/508.82
Ease discussing sex with parents at age 14											
Easy with one/both	7.7	(4.96- 11.77)	1	.	.	17.87	(14.54- 21.77)	1	.	.	876/553.84
Difficult	7.65	(3.30- 16.76)	0.99	0.36,2.73	0.988	24.15	(16.53- 33.85)	1.46	0.86,2.50	0.163	233/153.82
Didn't discuss with either	8.3	(6.46- 10.60)	1.08	0.63,1.86	0.768	17.84	(15.02- 21.06)	1	0.73,1.36	0.990	1672/1070.97
Varied depending on topic	16.33	(4.80- 43.02)	2.34	0.55,9.91	0.249	21.18	(12.59- 33.39)	1.23	0.63,2.41	0.538	95/ 60.08
Duration sexually active											
0,1	1.28	(0.38- 4.17)	1	.	.	2.14	(0.94- 4.80)	1	.	.	463/271.51
2,3	4.74	(2.82- 7.88)	3.84	1.02,14.45	0.046	10.5	(7.65- 14.26)	5.35	2.17,13.21	<0.001	723/462.27
4, 5 yrs	8.27	(5.57- 12.11)	6.96	1.92,25.17	0.003	18.66	(14.58- 23.56)	10.47	4.37,25.08	<0.001	772/517.75
6,7	11.00	(7.25- 16.35)	9.54	2.60,35.00	0.001	29.51	(24.63- 34.90)	19.10	8.03,45.46	<0.001	614/397.60
8,11	21.61	(15.42- 29.42)	21.27	5.91,76.59	<0.001	35.93	(29.51- 42.90)	25.59	10.57,61.96	<0.001	392/234.53

Table 34: Multivariable logistic regression, outcome: self-reported STI diagnosis. Women only (n= 1569/881.5)

	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Sexual competence												
Competent	1			1			1			1		
Non-competent	1.66	1.21,2.27	0.002	1.44	1.05,1.99	0.024	1.42	1.02,1.96	0.037	1.41	1.02,1.95	0.037
Age at first sex												
First sex ≥16	1			1			1			1		
First sex ≤15	1.51	1.11,2.05	0.009	1.58	1.16,2.15	0.004	1.52	1.11,2.08	0.009	1.06	0.75,1.50	0.742
IMD quintile												
1: least deprived				1	.	.	1	.	.	1	.	.
2				1	0.59,1.67	0.988	0.97	0.57,1.63	0.898	0.95	0.55,1.64	0.856
3				1.27	0.78,2.06	0.34	1.28	0.78,2.08	0.33	1.22	0.74,2.01	0.445
4				1.07	0.64,1.79	0.802	1.09	0.65,1.81	0.751	1.03	0.61,1.72	0.917
5: most deprived				1.08	0.65,1.80	0.772	1.1	0.66,1.83	0.72	0.99	0.59,1.65	0.960
Parental social class												
No response				0.85	0.51,1.42	0.532	0.85	0.51,1.42	0.537	1	0.58,1.71	0.994
Manual iv/v				1.15	0.77,1.72	0.483	1.19	0.80,1.77	0.38	1.24	0.84,1.84	0.283
Non-manual i/ii/iii				1	.	.	1	.	.	1	.	.
Educational level												
Left school at 16 no qualifications				1.82	1.04,3.19	0.036	1.86	1.07,3.25	0.028	1.44	0.82,2.53	0.201
Left school at 16 with qualifications				1.23	0.83,1.83	0.292	1.25	0.84,1.86	0.266	1.04	0.69,1.55	0.857
Left school 17+ with qualifications				1	.	.	1	.	.	1	.	.
Currently 16				0.12	0.03,0.40	0.001	0.11	0.03,0.39	0.001	0.58	0.16,2.09	0.402
Ethnic group												
White				1	.	.	1	.	.	1	.	.
Mixed				1.41	0.62,3.22	0.412	1.36	0.61,3.07	0.454	1.41	0.60,3.29	0.428
Asian, Chinese, Other				0.38	0.12,1.25	0.112	0.34	0.10,1.11	0.074	0.46	0.14,1.51	0.200
Black				3.46	1.49,8.03	0.004	3.36	1.47,7.67	0.004	4.36	1.87,10.13	0.001
Family Structure at 14												
Lived with both parents until 14				1			1			1		
Live with one or neither parents until 14				1.13	0.83,1.53	0.453	1.14	0.83,1.56	0.421	1.07	0.78,1.48	0.668

Main source of sex education								
Parents			0.85	0.52,1.39	0.507	0.84	0.51,1.38	0.485
School			1	.	.	1	.	.
Friends			1.52	1.04,2.22	0.032	1.41	0.96,2.07	0.078
Other			1.56	1.05,2.34	0.03	1.48	0.99,2.21	0.059
Ease discussing sex with parents at age 14								
Easy with one/both			1	.	.	1	.	.
Difficult			1.42	0.81,2.49	0.221	1.5	0.86,2.61	0.157
Didn't discuss with either			0.85	0.60,1.21	0.371	0.9	0.63,1.28	0.544
Varied depending on topic			1.29	0.66,2.55	0.455	1.26	0.62,2.57	0.52
Duration sexually active								
0,1						1	.	.
2,3						5.08	2.04,12.67	<0.001
4, 5 yrs						8.85	3.62,21.66	<0.001
6,7						16.89	7.07,40.38	<0.001
8,11						19.19	7.50,49.12	<0.001

Table 35: Multivariable logistic regression, outcome: self-reported STI diagnosis. Men only (n=1254/923.9)

	Model 1			Model 2			Model 3			Model 4		
Men – outcome: self-reported STI	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Sexual competence												
Competent	1			1			1			1		
Non-competent	1.16	0.74,1.84	0.518	1.16	0.72,1.87	0.549	1.18	0.73,1.89	0.495	1.17	0.73,1.88	0.504
Age at first sex												
First sex ≥16	1			1			1			1		
First sex ≤15	2.15	1.38,3.37	0.001	2.23	1.37,3.62	0.001	2.21	1.34,3.64	0.002	1.37	0.82,2.31	0.228
IMD quintile												
1: least deprived				1	.	.	1	.	.	1	.	.
2				1.4	0.68,2.90	0.360	1.4	0.67,2.89	0.369	1.45	0.70,3.03	0.319
3				1.14	0.50,2.58	0.753	1.11	0.48,2.55	0.809	1.18	0.51,2.74	0.706
4				1.11	0.49,2.50	0.805	1.05	0.48,2.30	0.911	1.08	0.49,2.38	0.844
5: most deprived				1.34	0.61,2.94	0.470	1.27	0.58,2.80	0.555	1.25	0.56,2.75	0.586
Parental social class												
No response				0.99	0.47,2.07	0.969	0.97	0.47,2.00	0.924	0.98	0.46,2.10	0.962
Manual iv/v				0.75	0.40,1.41	0.375	0.76	0.41,1.43	0.396	0.73	0.38,1.38	0.331
Non-manual i/ii/iii				1	.	.	1	.	.	1	.	.
Educational level												
Left school at 16 no qualifications				1.04	0.35,3.12	0.938	1.05	0.34,3.24	0.932	0.92	0.29,2.92	0.892
Left school at 16 with qualifications				1.67	0.97,2.87	0.062	1.82	1.08,3.06	0.025	1.63	0.97,2.75	0.065
Left school 17+ with qualifications				1	.	.	1	.	.	1	.	.
Currently 16				0.3	0.06,1.46	0.135	0.31	0.06,1.54	0.153	1.26	0.19,8.50	0.812
Ethnic group												
White				1	.	.	1	.	.	1	.	.
Mixed				1.03	0.30,3.58	0.958	1.02	0.28,3.66	0.974	1.12	0.32,3.90	0.857
Asian, Chinese, Other				1.53	0.58,4.08	0.390	1.65	0.62,4.38	0.319	1.63	0.63,4.25	0.315
Black				2.43	0.67,8.86	0.179	2.44	0.67,8.88	0.175	2.82	0.80,9.90	0.107
Family structure at 14												
Lived with both parents until 14				1			1			1		
Live with one or neither parents until 14				0.8	0.49,1.31	0.372	0.79	0.48,1.30	0.353	0.78	0.47,1.29	0.340

Main source of sex education								
Parents			1.38	0.55,3.49	0.497	1.21	0.45,3.22	0.704
School			1	.	.	1	.	.
Friends			1.84	1.04,3.26	0.038	1.75	0.99,3.08	0.055
Other			1.09	0.59,2.01	0.789	0.93	0.49,1.75	0.815
Ease discussing sex with parents at age 14								
Easy with one/both			1	.	.	1	.	.
Difficult			1.03	0.34,3.15	0.962	1.1	0.36,3.35	0.873
Didn't discuss with either			1.19	0.64,2.22	0.588	1.23	0.65,2.33	0.520
Varied depending on topic			3.38	0.81,14.00	0.093	3.45	0.87,13.66	0.078
Duration sexually active								
0,1						1	.	.
2,3						3.64	0.76,17.42	0.105
4, 5 yrs						6.14	1.24,30.27	0.026
6,7						7.57	1.49,38.51	0.015
8,11						17.34	3.37,89.38	0.001

Urine test positive for HPV

Table 36 presents the prevalence of urine-tested HPV among the 16-24 year old respondents who have ever had sexual intercourse, by a series of variables. A significantly higher proportion of women tested positive for HPV (45.3%) compared to men (16.0%)³. Among both men and women, higher rates of HPV infection were detected among respondents who were not sexually competent at first sex (male OR: 1.68, female OR: 1.59), whose sexual debut occurred at age 15 or younger (male OR: 2.04, female OR: 1.44), and participants who had been sexually active for longer. Among men, lower educational level and reporting difficult/no discussion with parents about sex at age 14 were associated with increased rates of HPV. Among women, those of Asian, Chinese or 'other' ethnicity were less likely to test positive for HPV, as were respondents who reported living with both natural parents at age 14 (borderline significance at $p=0.086$).

Table 37 shows the results of the multivariable logistic regression among female respondents with the outcome of testing positive for HPV. In model 1, lack of sexual competence at first sex retained a significant association with HPV (AOR: 1.49), while the association between sexual debut before 16 and HPV was borderline statistically significant ($p=0.071$). With the addition of the other explanatory variables to the models, little change in the association between sexual competence and HPV was observed; the AOR in the final adjusted model was 1.59. The associations between sex before 16 and HPV became progressively less significant with addition of further explanatory variables to the model (final AOR: 1.17, $p=0.349$).

Table 38 presents the same multivariable logistic models for male respondents. In the first model, sexual debut before 16 was significantly associated with HPV (AOR: 1.69), while the association between sexual non-competence and HPV became borderline significant (AOR: 1.50, $p=0.070$). The association between sexual non-competence and HPV was statistically significant across the further three adjusted models, with an AOR of 1.74 ($p=0.034$) in the final fully adjusted model. On the addition of duration sexually active to final model, the association between sex before 16 and HPV became non-significant (AOR: 1.21, $p=0.450$).

³ This is likely due to the far lower sensitivity of the urine test for HPV among men, compared with women (Bissett et al., 2011)

Table 36: Proportions and unadjusted odds ratios of Natsal-3 respondents aged 16-24 at interview who tested positive for HPV, by gender and explanatory variables.

	Women					Men					
	%	95% CI	OR	95% CI	p-value	%	95% CI	OR	95% CI	p-value	N (unweighted/weighted)
ALL	45.3	(41.6, 48.9)				16.0	(13.2, 19.1)				1683/1116
Sexual competence											
Competent	39.10	(33.69- 44.80)	1			12.88	(9.84- 16.68)	1			824/552.59
Non-competent	50.51	(45.64- 55.36)	1.59	1.17,2.15	0.003	19.91	(15.36- 25.40)	1.68	1.08,2.61	0.021	847/553.92
Age at first sex											
First sex ≥16	41.99	(37.25- 46.88)	1			12.08	(8.99- 16.03)	1			951/686.47
First sex ≤15	51.08	(45.74- 56.41)	1.44	1.08,1.93	0.013	21.92	(17.13- 27.61)	2.04	1.29,3.23	0.002	727/424.91
IMD quintile											
1: least deprived	50.97	(42.04- 59.84)	1			14.28	(8.59- 22.79)	1			289/197.96
2	42.86	(35.09- 51.01)	0.72	0.44,1.19	0.201	14.3	(9.44- 21.09)	1.00	0.47,2.12	0.996	321/216.36
3	47.45	(39.30- 55.74)	0.87	0.54,1.40	0.565	15.46	(10.34- 22.47)	1.10	0.53,2.28	0.802	317/201.38
4	40.64	(32.69- 49.10)	0.66	0.40,1.08	0.099	19.58	(13.15- 28.13)	1.46	0.70,3.06	0.314	356/257.09
5: most deprived	45.36	(38.29- 52.62)	0.8	0.50,1.27	0.343	15.16	(10.16- 22.01)	1.07	0.52,2.23	0.851	401/242.86
Parental social class											
No response	40.95	(30.07- 52.80)	0.85	0.51,1.41	0.531	11.02	(5.09- 22.24)	0.68	0.28,1.64	0.385	165/104.32
Manual iv/v	45.28	(37.14- 53.69)	1.01	0.69,1.50	0.941	16.73	(11.23- 24.18)	1.10	0.63,1.91	0.740	328/208.81
Non-manual i/ii/iii	44.92	(40.44- 49.48)	1			15.47	(12.18- 19.45)	1			1133/770.58
Educational level											
Left school at 16 no qualifications	39.85	(26.70- 54.65)	0.78	0.42,1.47	0.447	11.65	(4.73- 25.92)	0.75	0.27,2.07	0.580	93/ 56.08
Left school at 16 with qualifications	48.31	(39.43- 57.29)	1.11	0.74,1.65	0.618	24.39	(17.82- 32.43)	1.84	1.12,3.02	0.016	312/185.68
Left school 17+ with qualifications	45.77	(41.52- 50.08)	1	.	.	14.92	(11.67- 18.89)	1	.	.	1164/806.32
Currently 16	31.40	(19.93- 45.70)	0.54	0.29,1.02	0.057	5.7	(1.65- 17.92)	0.34	0.09,1.28	0.111	108/ 62.04
Ethnic group											
White	46.20	(42.31- 50.13)	1	.	.	17.07	(14.08- 20.54)	1	.	.	1529/975.34
Mixed	62.28	(42.49- 78.67)	1.92	0.85,4.35	0.117	12.42	(2.51- 43.89)	0.69	0.12,3.85	0.671	56/ 38.16
Asian, Chinese, Other	22.03	(10.67- 40.05)	0.33	0.14,0.79	0.013	6.19	(1.32- 24.58)	0.32	0.06,1.63	0.170	55/ 60.94
Black	42.60	(25.78- 61.32)	0.86	0.40,1.88	0.712	3.5	(0.46- 22.14)	0.18	0.02,1.39	0.100	39/ 37.18
Family Structure at 14											
Lived with both parents until 14	42.78	(38.12- 47.57)	1			14.36	(11.21- 18.21)	1			1036/740.34
One or no parent	49.34	(43.62- 55.09)	1.3	0.96,1.76	0.086	19.48	(14.56- 25.58)	1.44	0.91,2.28	0.114	642/369.74

Main source of sex education											
Parents	48.50	(39.30- 57.80)	1.18	0.75,1.86	0.471	20.65	(9.90- 38.16)	1.69	0.64,4.47	0.290	192/119.75
School	44.36	(38.49- 50.39)	1			13.35	(8.90- 19.54)	1			594/399.71
Friends	42.40	(35.50- 49.61)	0.92	0.64,1.34	0.674	16.33	(11.46- 22.73)	1.27	0.67,2.39	0.465	438/284.72
Other	48.58	(40.63- 56.60)	1.18	0.79,1.77	0.405	17.12	(12.65- 22.75)	1.34	0.75,2.38	0.318	453/306.27
Ease discussing sex with parents at age 14											
Easy with one/both	47.71	(41.37- 54.12)	1			24.75	(18.01- 33.01)	1			498/324.11
Difficult	43.7	(31.99- 56.16)	0.85	0.48,1.49	0.573	11.87	(5.49- 23.81)	0.41	0.16,1.04	0.060	137/ 94.89
Didn't discuss with either	42.76	(37.93- 47.73)	0.82	0.59,1.13	0.229	13.19	(10.34- 16.67)	0.46	0.28,0.76	0.003	953/638.40
Varied depending on topic	47.43	(29.11- 66.47)	0.99	0.43,2.27	0.979	0.00	.	.	.	.	47/ 31.07
Duration sexually active											
0,1	32.27	(24.10- 41.68)	1	.	.	4.47	(1.70- 11.27)	1	.	.	250/162.23
2,3	42.89	(35.65- 50.44)	1.58	0.95,2.61	0.078	11.88	(7.00- 19.45)	2.88	0.90,9.16	0.073	406/277.69
4, 5 yrs	45.00	(37.56- 52.68)	1.72	1.04,2.85	0.036	13.26	(9.07- 18.99)	3.27	1.11,9.58	0.031	432/298.98
6,7	53.22	(45.55- 60.74)	2.39	1.44,3.97	0.001	26.36	(19.60- 34.45)	7.64	2.65,22.09	<0.001	358/234.07
8,11	51.25	(42.06- 60.36)	2.21	1.27,3.83	0.005	28.07	(18.62- 39.96)	8.33	2.71,25.67	<0.001	232/138.40

Table 37: Multivariable logistic regression, outcome: tested positive for HPV. Women only (n=875/525.37)

	Model 1			Model 2			Model 3			Model 4		
Women - outcome: HPV	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Sexual competence												
Competent	1			1			1			1		
Non-competent	1.49	1.08,2.04	0.014	1.56	1.13,2.17	0.007	1.58	1.14,2.20	0.006	1.59	1.14,2.21	0.006
Age at first sex												
First sex ≥16	1			1			1			1		
First sex ≤15	1.32	0.98,1.78	0.071	1.28	0.94,1.75	0.118	1.27	0.93,1.74	0.131	1.17	0.84,1.64	0.349
IMD quintile												
1: least deprived				1	.	.	1	.	.	1	.	.
2				0.64	0.38,1.07	0.09	0.64	0.38,1.06	0.083	0.65	0.39,1.07	0.092
3				0.86	0.51,1.43	0.56	0.85	0.51,1.42	0.543	0.83	0.50,1.38	0.475
4				0.65	0.38,1.11	0.113	0.64	0.38,1.10	0.108	0.63	0.37,1.09	0.097
5: most deprived				0.72	0.43,1.22	0.221	0.72	0.42,1.22	0.216	0.69	0.41,1.17	0.167
Parental social class												
No response				0.81	0.47,1.39	0.438	0.81	0.47,1.39	0.448	0.88	0.51,1.52	0.65
Manual iv/v				1.07	0.72,1.62	0.729	1.08	0.72,1.62	0.725	1.1	0.73,1.65	0.643
Non-manual i/ii/iii				1	.	.	1	.	.	1	.	.
Educational level												
Left school at 16 no qualifications				0.75	0.37,1.48	0.402	0.74	0.37,1.46	0.381	0.67	0.33,1.34	0.257
Left school at 16 with qualifications				0.94	0.59,1.49	0.786	0.94	0.59,1.48	0.776	0.91	0.57,1.45	0.681
Left school 17+ with qualifications				1	.	.	1	.	.	1	.	.
Currently 16				0.48	0.25,0.94	0.033	0.48	0.25,0.95	0.036	0.7	0.32,1.51	0.359
Ethnic group												
White				1	.	.	1	.	.	1	.	.
Mixed				1.49	0.60,3.72	0.391	1.48	0.60,3.66	0.392	1.47	0.60,3.65	0.401
Asian, Chinese, Other				0.32	0.13,0.81	0.017	0.32	0.13,0.82	0.017	0.33	0.13,0.85	0.021
Black				0.76	0.35,1.67	0.492	0.73	0.32,1.64	0.44	0.77	0.34,1.75	0.531
Family structure at 14												
Lived with both parents until 14				1			1			1		
Live with one or neither parents until 14				1.1	0.79,1.54	0.579	1.09	0.78,1.53	0.62	1.07	0.76,1.50	0.708

Main source of sex education								
Parents			1.12	0.68,1.85	0.658	1.13	0.68,1.86	0.644
School			1	.	.	1	.	.
Friends			0.85	0.57,1.26	0.42	0.83	0.56,1.23	0.344
Other			1.17	0.77,1.77	0.467	1.16	0.76,1.77	0.499
Ease discussing sex with parents at age 14								
Easy with one/both			1	.	.	1	.	.
Difficult			1.02	0.58,1.81	0.943	1	0.57,1.78	0.992
Didn't discuss with either			0.98	0.68,1.41	0.894	0.99	0.68,1.43	0.953
Varied depending on topic			1.17	0.47,2.93	0.738	1.17	0.46,3.02	0.738
Duration sexually active								
0,1						1	.	.
2,3						1.43	0.82,2.49	0.213
4, 5 yrs						1.44	0.79,2.62	0.228
6,7						2.03	1.14,3.63	0.017
8,11						1.69	0.87,3.30	0.122

Table 38: Multivariable logistic regression, outcome: tested positive for HPV. Men only (n=724/538.98)

	Model 1			Model 2			Model 3			Model 4		
Men - outcome: HPV	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Sexual competence												
Competent	1			1			1			1		
Non-competent	1.55	0.96,2.50	0.070	1.75	1.05,2.93	0.033	1.69	1.03,2.80	0.039	1.74	1.04,2.90	0.034
Age at first sex												
First sex ≥16	1			1			1			1		
First sex ≤15	1.69	1.04,2.74	0.033	1.65	1.01,2.69	0.046	1.61	0.99,2.60	0.054	1.21	0.74,1.99	0.450
IMD quintile												
1: least deprived				1	.	.	1	.	.	1	.	.
2				1.02	0.47,2.22	0.957	1.00	0.46,2.17	0.997	1.00	0.46,2.21	0.991
3				0.93	0.42,2.05	0.852	0.96	0.44,2.08	0.911	1.04	0.47,2.30	0.932
4				1.59	0.71,3.56	0.258	1.59	0.73,3.44	0.239	1.65	0.76,3.58	0.202
5: most deprived				1.15	0.51,2.61	0.731	1.20	0.55,2.65	0.648	1.19	0.53,2.69	0.673
Parental social class												
No response				0.6	0.21,1.73	0.346	0.62	0.22,1.76	0.371	0.65	0.21,1.97	0.445
Manual iv/v				0.94	0.52,1.71	0.843	1.01	0.55,1.83	0.984	0.97	0.52,1.81	0.936
Non-manual i/ii/iii				1	.	.	1	.	.	1	.	.
Educational level												
Left school at 16 no qualifications				0.54	0.16,1.83	0.320	0.53	0.16,1.79	0.308	0.42	0.12,1.44	0.167
Left school at 16 with qualifications				1.52	0.88,2.63	0.131	1.51	0.88,2.62	0.136	1.36	0.78,2.35	0.273
Left school 17+ with qualifications				1	.	.	1	.	.	1	.	.
Currently 16				0.34	0.09,1.39	0.135	0.35	0.09,1.39	0.135	0.76	0.18,3.17	0.704
Ethnic group												
White				1	.	.	1	.	.	1	.	.
Mixed				0.11	0.01,0.85	0.035	0.12	0.02,0.93	0.042	0.12	0.02,0.97	0.047
Asian, Chinese, Other				0.28	0.06,1.40	0.121	0.29	0.06,1.37	0.117	0.32	0.07,1.44	0.137
Black				0.18	0.02,1.57	0.121	0.2	0.02,1.76	0.146	0.2	0.02,1.83	0.154
Family structure at 14												
Lived with both parents until 14				1			1			1		
Live with one or neither parents until 14				1.26	0.74,2.13	0.398	1.21	0.71,2.07	0.479	1.2	0.69,2.09	0.512

Main source of sex education								
Parents			1.27	0.47,3.43	0.640	1.35	0.50,3.59	0.553
School			1	.	.	1	.	.
Friends			1.23	0.66,2.28	0.512	1.24	0.65,2.34	0.514
Other			1.07	0.58,1.99	0.829	1.07	0.58,1.97	0.838
Discussion with parents about sex								
Discussed			1			1		
Did not discuss			0.72	0.43,1.20	0.206	0.75	0.44,1.28	0.291
Duration sexually active								
0,1						1	.	.
2,3						2.38	0.82,6.90	0.110
4, 5 yrs						2.3	0.76,6.90	0.138
6,7						5.35	1.86,15.37	0.002
8,11						4.11	1.26,13.36	0.019

Low sexual function

Table 39 shows that among women who were sexual competent at sexual debut, 8.8% had experienced low sexual function in the year prior to interview, compared to 16.8% of women who were not competent at first sex (OR: 2.09). Among men, low sexual function also differed according to competence status at sexual debut, though the association was slightly weaker (OR: 1.49). There was no evidence of an association between age at first sex and low sexual function among either gender. Among men, low sexual functioning was more prevalent among those who cited 'friends' as their main source of sex education, respondents who reported no discussion with parents about sex at age 14, and those who had been sexually active for more than a year.

Table 40 shows that even when adjusting for age at first sex, women who were not competent at first sex were still more than twice as likely to have experienced low sexual functioning in the last year compared with those who were competent at first sex. This association maintained statistical significance with the addition of the explanatory variables into the model (final AOR: 2.02, $p=0.001$). Sex before 16 was not associated with low sexual functioning in any of the models.

In Table 41 are the corresponding results for male respondents. As observed in the crude odds ratios, there was an association between non-competence at first sex and lower sexual functioning, when controlling for age at first sex. With the addition of further explanatory variables to the model this association remained (final AOR: 1.48, $p=0.045$). As was observed among women, sex before 16 was not associated with low sexual functioning among men in any of the models.

Table 39: Proportions and unadjusted odds ratios of Natsal-3 respondents aged 16-24 at interview who experienced low sexual function in the last year, by gender and explanatory variables.

	Men					Women					N (unweighted/weighted)
	%	95% CI	OR	95% CI	p-value	%	95% CI	OR	95% CI	p-value	
ALL	13.84	(11.87,16.08)				12.92	(11.13, 14.95)				2862/1813.69
Sexual competence											
Competent	11.64	(9.27- 14.53)	1			8.80	(6.72- 11.45)	1			1477/954.42
Non-competent	16.42	(13.18- 20.27)	1.49	1.03,2.15	0.033	16.76	(14.03- 19.91)	2.09	1.46,2.99	<0.001	1374/852.60
Age at first sex											
First sex ≥16	14.17	(11.62- 17.18)	1			12.53	(10.24- 15.25)	1			1691/1124.39
First sex ≤15	13.33	(10.44- 16.85)	0.93	0.65,1.33	0.696	13.59	(10.93- 16.78)	1.1	0.78,1.54	0.585	1171/689.30
IMD quintile											
1: least deprived	15.98	(11.19- 22.32)	1	.	.	13.13	(9.17- 18.44)	1	.	.	489/313.17
2	11.27	(7.57- 16.47)	0.67	0.36,1.23	0.196	11.11	(7.78- 15.64)	0.83	0.47,1.46	0.513	531/339.49
3	13.5	(9.21- 19.37)	0.82	0.45,1.50	0.521	14.78	(10.35- 20.67)	1.15	0.65,2.03	0.637	535/343.04
4	13.8	(9.70- 19.26)	0.84	0.47,1.50	0.557	14.19	(10.78- 18.45)	1.09	0.66,1.82	0.729	622/420.47
5: most deprived	14.77	(10.90- 19.71)	0.91	0.53,1.57	0.736	11.4	(8.22- 15.60)	0.85	0.50,1.46	0.560	685/397.52
Parental social class											
No response	14.17	(8.33- 23.08)	1.06	0.56,2.00	0.866	16.12	(10.86- 23.26)	1.27	0.77,2.09	0.349	299/181.38
Manual iv/v	14.18	(10.19- 19.39)	1.06	0.68,1.64	0.804	10.25	(7.06- 14.65)	0.75	0.48,1.19	0.224	533/320.10
Non-manual i/ii/iii	13.52	(11.15- 16.29)	1	.	.	13.16	(10.96- 15.72)	1	.	.	1933/1261.88
Educational level											
Left school at 16 no qualifications	13.12	(6.99- 23.28)	0.87	0.42,1.80	0.698	16.51	(9.82- 26.43)	1.27	0.68,2.38	0.456	149/ 81.23
Left school at 16 with qualifications	13.16	(9.12- 18.63)	0.87	0.55,1.39	0.555	11.74	(7.85- 17.19)	0.85	0.52,1.39	0.526	544/316.41
Left school 17+ with qualifications	14.85	(12.42- 17.67)	1	.	.	13.47	(11.34- 15.93)	1	.	.	1978/1309.31
Currently 16	5.45	(1.90- 14.66)	0.33	0.11,1.00	0.049	5.02	(1.79- 13.28)	0.34	0.11,1.00	0.051	186/103.36
Ethnic group											
White	13.29	(11.26- 15.62)	1	.	.	12.05	(10.34- 14.00)	1	.	.	2576/1606.04
Mixed	13.93	(4.81- 34.15)	1.06	0.32,3.44	0.928	22.68	(11.76- 39.23)	2.14	0.95,4.80	0.065	103/ 62.43
Asian, Chinese and Other	22.04	(11.51- 38.06)	1.84	0.82,4.14	0.137	19.57	(9.77- 35.35)	1.78	0.78,4.06	0.174	106/ 84.81
Black	16.32	(5.88- 37.86)	1.27	0.40,4.07	0.684	15.86	(6.50- 33.83)	1.38	0.50,3.77	0.535	77/ 60.41
Family structure at 14											
Lived with both parents until 14	14.49	(12.03- 17.35)	1			12.92	(10.60- 15.67)	1			1788/1210.58
One or neither parent	12.34	(9.35- 16.10)	0.83	0.57,1.21	0.338	12.59	(10.04- 15.68)	0.97	0.69,1.37	0.865	1073/601.85

Main source of sex education											
Parents	13.82	(7.89- 23.09)	1.19	0.60,2.38	0.614	13.5	(9.29- 19.23)	1.21	0.73,2.01	0.455	336/203.10
School	11.84	(8.91- 15.56)	1	.	.	11.41	(8.89- 14.52)	1	.	.	1016/645.13
Friends	16.99	(12.73- 22.32)	1.53	0.95,2.44	0.079	14.52	(11.11- 18.75)	1.32	0.88,1.97	0.174	759/471.07
Other	13.5	(10.25- 17.58)	1.16	0.74,1.82	0.51	13.37	(9.49- 18.51)	1.2	0.74,1.95	0.466	738/486.06
Ease discussing sex with parents at age 14											
Easy with one/both	9.97	(6.96- 14.10)	1	.	.	11.97	(8.90- 15.90)	1	.	.	852/539.24
Difficult	13.91	(7.22- 25.14)	1.46	0.64,3.31	0.366	14.51	(8.70- 23.22)	1.25	0.64,2.44	0.516	225/148.13
Didn't discuss with either	15.96	(13.25- 19.09)	1.71	1.09,2.70	0.02	13.44	(11.05- 16.26)	1.14	0.77,1.71	0.514	1607/1024.00
Varied depending on topic	4.76	(1.10- 18.32)	0.45	0.10,2.12	0.313	6.03	(2.31- 14.85)	0.47	0.17,1.35	0.161	95/ 60.08
Duration sexually active											
0,1	8.13	(4.85- 13.34)	1	.	.	9.12	(5.33- 15.17)	1	.	.	452/265.11
2,3	12.38	(9.12- 16.59)	1.6	0.84,3.04	0.156	11.75	(8.52- 15.98)	1.33	0.67,2.65	0.421	689/438.52
4, 5 yrs	16.6	(12.67- 21.45)	2.25	1.18,4.30	0.014	14.06	(10.49- 18.58)	1.63	0.83,3.19	0.153	741/497.33
6,7	15.62	(10.88- 21.92)	2.09	1.05,4.18	0.037	14.04	(10.52- 18.50)	1.63	0.84,3.15	0.147	595/382.57
8,11	14.26	(9.17- 21.51)	1.88	0.88,3.99	0.101	15.17	(10.47- 21.46)	1.78	0.87,3.64	0.113	385/230.16

Table 40: Multivariable logistic regression – outcome: low sexual functioning (women n: 1531/856.53)

	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Women – outcome: low sexual function												
Sexual competence												
Competent	1			1			1			1		
Non-competent	2.07	1.42,3.03	<0.001	2.07	1.39,3.09	<0.001	2.02	1.34,3.03	0.001	2.02	1.34,3.03	0.001
Age at first sex												
First sex ≥16	1			1			1			1		
First sex ≤15	0.94	0.66,1.36	0.756	1.05	0.73,1.53	0.786	1.06	0.73,1.55	0.757	1.01	0.67,1.53	0.968
IMD quintile												
1: least deprived				1	.	.	1	.	.	1	.	.
2				0.81	0.45,1.45	0.48	0.81	0.45,1.47	0.492	0.81	0.45,1.48	0.499
3				1.19	0.66,2.15	0.56	1.19	0.66,2.15	0.555	1.18	0.65,2.14	0.576
4				0.95	0.55,1.63	0.842	0.94	0.55,1.63	0.835	0.94	0.54,1.64	0.829
5: most deprived				0.77	0.43,1.41	0.401	0.78	0.43,1.42	0.421	0.77	0.42,1.41	0.402
Parental social class												
No response				1.18	0.68,2.06	0.548	1.2	0.69,2.07	0.517	1.23	0.71,2.13	0.470
Manual iv/v				0.78	0.48,1.26	0.311	0.78	0.48,1.25	0.299	0.78	0.49,1.26	0.309
Non-manual i/ii/iii				1	.	.	1	.	.	1	.	.
Educational level												
Left school at 16 no qualifications				1.24	0.58,2.64	0.571	1.21	0.56,2.60	0.623	1.15	0.52,2.52	0.727
Left school at 16 with qualifications				0.86	0.51,1.45	0.569	0.85	0.51,1.44	0.548	0.82	0.48,1.40	0.468
Left school 17+ with qualifications				1	.	.	1	.	.	1	.	.
Currently 16				0.38	0.12,1.15	0.087	0.37	0.12,1.12	0.078	0.43	0.13,1.42	0.167
Ethnic group												
White				1	.	.	1	.	.	1	.	.
Mixed				2.04	0.88,4.71	0.095	2.12	0.92,4.87	0.077	2.13	0.93,4.88	0.073
Asian, Chinese, other				1.64	0.70,3.83	0.253	1.6	0.71,3.65	0.259	1.69	0.74,3.90	0.216
Black				0.89	0.26,3.05	0.858	0.87	0.25,3.00	0.829	0.88	0.25,3.02	0.835
Family structure at 14												
Lived with both parents until 14				1			1			1		
Live with one or neither parents until 14				0.91	0.63,1.34	0.646	0.91	0.62,1.32	0.612	0.90	0.61,1.31	0.573

Main source of sex education								
Parents			1.17	0.67,2.06	0.584	1.17	0.67,2.07	0.581
School			1	.	.	1	.	.
Friends			1.15	0.76,1.74	0.497	1.13	0.75,1.72	0.550
Other			1.03	0.61,1.74	0.920	1.01	0.59,1.73	0.962
Ease discussing sex with parents at age 14								
Easy with one/both			1	.	.	1	.	.
Difficult			1.22	0.62,2.41	0.560	1.23	0.62,2.45	0.551
Didn't discuss with either			1.15	0.74,1.77	0.540	1.15	0.75,1.78	0.517
Varied depending on topic			0.52	0.18,1.48	0.222	0.51	0.18,1.48	0.216
Duration sexually active								
0,1						1	.	.
2,3						1.01	0.49,2.09	0.982
4, 5 yrs						1.10	0.53,2.31	0.792
6,7						1.32	0.66,2.63	0.428
8,11						1.30	0.57,2.98	0.533

Table 41: Multivariable logistic regression – outcome: low sexual functioning (men n: 1199/883.38)

	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Men – outcome: low sexual function												
Sexual competence												
Competent	1			1			1			1		
Non-competent	1.45	0.99,2.13	0.059	1.46	0.99,2.14	0.055	1.47	1.00,2.15	0.048	1.48	1.01,2.17	0.045
Age at first sex												
First sex ≥16	1			1			1			1		
First sex ≤15	0.82	0.56,1.19	0.288	0.93	0.63,1.38	0.733	0.93	0.63,1.39	0.739	0.87	0.58,1.32	0.518
IMD quintile												
1: least deprived				1	.	.	1	1.00,1.00	.	1	.	.
2				0.66	0.36,1.22	0.186	0.66	0.35,1.22	0.186	0.64	0.34,1.20	0.167
3				0.71	0.38,1.32	0.278	0.69	0.37,1.29	0.243	0.69	0.37,1.28	0.241
4				0.72	0.41,1.27	0.262	0.73	0.42,1.29	0.278	0.72	0.41,1.26	0.250
5: most deprived				0.78	0.44,1.37	0.380	0.75	0.42,1.32	0.316	0.72	0.41,1.28	0.270
Parental social class												
No response				1.18	0.62,2.27	0.61	1.08	0.58,2.02	0.798	1.1	0.59,2.06	0.757
Manual iv/v				1.01	0.64,1.58	0.979	0.96	0.60,1.53	0.862	0.98	0.61,1.56	0.916
Non-manual i/ii/iii				1	.	.	1	.	.	1	.	.
Educational level												
Left school at 16 no qualifications				0.83	0.36,1.90	0.652	0.81	0.35,1.85	0.609	0.78	0.34,1.80	0.566
Left school at 16 with qualifications				0.91	0.56,1.47	0.688	0.88	0.54,1.44	0.612	0.85	0.52,1.39	0.521
Left school 17+ with qualifications				1	.	.	1	.	.	1	.	.
Currently 16				0.4	0.13,1.22	0.108	0.41	0.13,1.27	0.123	0.61	0.18,2.08	0.429
Ethnic group												
White				1	.	.	1	.	.	1	.	.
Mixed				1.3	0.39,4.35	0.668	1.07	0.32,3.63	0.909	1.11	0.33,3.73	0.871
Asian, Chinese, other				1.56	0.68,3.62	0.295	1.51	0.65,3.50	0.335	1.54	0.67,3.57	0.312
Black				1.44	0.44,4.68	0.549	1.37	0.43,4.39	0.595	1.36	0.42,4.35	0.605
Family structure at 14												
Lived with both parents until 14				1			1			1		
Live with one or neither parents until 14				0.79	0.53,1.19	0.262	0.82	0.55,1.24	0.357	0.81	0.54,1.23	0.327

Main source of sex education								
Parents			1.82	0.84,3.96	0.128	1.82	0.83,3.98	0.132
School			1	.	.	1	.	.
Friends			1.55	0.96,2.48	0.071	1.48	0.93,2.36	0.100
Other			1.14	0.71,1.84	0.590	1.08	0.67,1.74	0.741
Ease discussing sex with parents at age 14								
Easy with one/both			1	.	.	1	.	.
Difficult			1.59	0.68,3.71	0.280	1.58	0.68,3.70	0.291
Didn't discuss with either			1.85	1.14,3.02	0.014	1.89	1.15,3.10	0.012
Varied depending on topic			0.53	0.11,2.52	0.422	0.55	0.11,2.70	0.465
Duration sexually active								
0,1						1	.	.
2,3						1.45	0.70,3.03	0.320
4, 5 yrs						1.93	0.91,4.08	0.084
6,7						1.96	0.86,4.47	0.112
8,11						1.46	0.60,3.58	0.403

Table 42: Proportions and unadjusted odds ratios of Natsal-3 female respondents aged 16-24 at interview who experienced an unplanned pregnancy in the last year, by explanatory variables.

	Women					
	%	95% CI	OR	95% CI	p-value	N (unweighted/weighted)
ALL	2.83	(2.09- 3.82)				1577/881.68
Sexual competence						
Competent	1.68	(0.99- 2.85)	1			758/436.70
Non-competent	3.97	(2.75- 5.70)	2.42	1.25,4.68	0.009	814/442.51
Age at first sex						
First sex ≥16	1.54	(0.89- 2.67)	1			949/563.47
First sex ≤15	5.10	(3.56- 7.25)	3.43	1.75,6.73	<0.001	628/318.21
IMD quintile						
1: least deprived	2.01	(0.81- 4.94)	1	.	.	267/154.07
2	2.04	(0.89- 4.61)	1.01	0.29,3.54	0.985	290/162.01
3	2.89	(1.30- 6.28)	1.45	0.42,4.96	0.556	297/174.82
4	3.49	(2.08- 5.82)	1.76	0.60,5.14	0.299	337/193.38
5: most deprived	3.40	(2.00- 5.72)	1.71	0.58,5.03	0.326	386/197.39
Parental social class						
No response	4.95	(2.20- 10.77)	1.78	0.71,4.45	0.217	152/ 77.91
Manual iv/v	1.94	(0.82- 4.54)	0.68	0.26,1.74	0.416	292/157.33
Non-manual i/ii/iii	2.84	(1.99- 4.05)	1	.	.	1079/623.16
Educational level						
Left school at 16 no qualifications	4.69	(1.31- 15.39)	1.85	0.48,7.22	0.374	82/ 35.86
Left school at 16 with qualifications	3.03	(1.54- 5.86)	1.18	0.54,2.59	0.685	265/130.60
Left school 17+ with qualifications	2.58	(1.78- 3.74)	1	.	.	1134/667.92
Currently 16	2.82	(0.88- 8.65)	1.1	0.32,3.79	0.885	92/ 44.44
Ethnic group						
White	2.90	(2.10- 3.99)	1			1420/777.99
Mixed	2.77	(0.65- 11.02)	0.95	0.21,4.31	0.950	61/ 33.90
Asian, Chinese, other	0.00	(0.00, 0.00)	.	.	.	53/ 37.79
Black	4.51	(1.34- 14.09)	1.58	0.44,5.72	0.486	42/ 31.30
Family Structure at 14						
Lived with both parents until 14	2.36	(1.59- 3.50)	1			948/563.20
Lived with one or neither parent	3.66	(2.30- 5.78)	1.57	0.84,2.93	0.159	628/317.23
Main source of sex education						
Parents	4.53	(2.34- 8.58)	1.82	0.76,4.35	0.180	233/125.63
School	2.55	(1.49- 4.33)	1	.	.	579/325.99
Friends	2.52	(1.45- 4.34)	0.99	0.45,2.17	0.975	427/235.67
Other	2.60	(1.29- 5.16)	1.02	0.42,2.48	0.965	335/192.08
Ease discussing sex with parents at age 14						
Easy with one/both	3.41	(2.03- 5.66)	1			502/279.08
Difficult	2.6	(1.14- 5.79)	0.76	0.28,2.03	0.579	140/ 81.24
Didn't discuss with either	2.77	(1.82- 4.18)	0.81	0.41,1.60	0.536	832/470.53
Varied depending on topic	0.00	(0.00, 0.00)	.	.	.	60/ 32.06
Duration sexually active						
0,1	1.55	(0.56- 4.20)	1	.	.	250/132.69
2,3	2.99	(1.60- 5.54)	1.96	0.59,6.55	0.276	369/210.20
4, 5 yrs	2.59	(1.34- 4.94)	1.69	0.49,5.77	0.403	384/228.11
6,7	3.24	(1.80- 5.77)	2.12	0.65,6.96	0.213	355/201.27
8,11	3.77	(1.95- 7.17)	2.49	0.72,8.54	0.148	219/109.40

Table 42 shows that having had an unplanned pregnancy in the year prior to interview is significantly associated with having had sex before the age of 16 (OR: 3.43) and also, having been 'non-competent' at sexual debut (OR: 2.42). Though general trends were observed whereby unplanned pregnancy seem to be more prevalent among women with a lower level of education, and those who did not live with both parents while growing up, none of these factors showed statistically significant associations with unplanned pregnancy.

Table 43 presents the results of the multivariable logistic regression models with unplanned pregnancy as the outcome. When sexual competence and age at sexual debut are included in the same model (model 1), first intercourse before 16 is still associated with unplanned pregnancy in the last year (AOR: 2.82), albeit more weakly than observed in the crude odds ratio. The association between sexual non-competence and unplanned pregnancy also reduces in magnitude (AOR: 1.99), and becomes borderline statistically significant ($p=0.058$), suggestive of mutual confounding occurring between sexual competence and sex before 16. With the addition of the socio-demographic variables, and those relating to learning about sex, and duration sexually active variable to the model, the positive associations between sexual debut before 16 and unplanned pregnancy, and between non-competence at first sex and unplanned pregnancy, remain with adjusted odds ratios of 2.93 and 1.96, respectively, in the final model - though the association observed between sexual non-competence and unplanned pregnancy was of borderline statistical significance ($p=0.078$).

Table 43: Multivariable logistic regression – outcome: unplanned pregnancy in the last year (n: 1509/849.01)

	Model 1			Model 2			Model 3			Model 4		
Outcome: unplanned pregnancy	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Sexual competence												
Competent	1			1			1			1		
Non-competent	1.99	0.98,4.03	0.058	1.93	0.91,4.09	0.085	1.95	0.92,4.14	0.081	1.96	0.93,4.14	0.078
Age at first sex												
First sex ≥16	1			1			1			1		
First sex ≤15	2.82	1.40,5.71	0.004	2.83	1.38,5.78	0.004	2.83	1.38,5.81	0.005	2.93	1.34,6.39	0.007
IMD quintile												
1: least deprived				1	.	.	1	.	.	1	.	.
2				1.33	0.34,5.16	0.676	1.34	0.34,5.22	0.672	1.33	0.34,5.24	0.680
3				1.9	0.52,6.97	0.335	1.87	0.51,6.82	0.343	1.87	0.50,6.94	0.351
4				2.24	0.68,7.38	0.185	2.23	0.67,7.36	0.189	2.25	0.67,7.57	0.189
5: most deprived				2.05	0.61,6.84	0.244	2.09	0.62,7.04	0.232	2.08	0.60,7.14	0.247
Parental social class												
No response				1.52	0.54,4.23	0.428	1.54	0.57,4.19	0.393	1.56	0.57,4.29	0.385
Manual iv/v				0.56	0.21,1.47	0.238	0.56	0.22,1.46	0.238	0.57	0.22,1.49	0.255
Non-manual i/ii/iii				1	.	.	1	.	.	1	.	.
Educational level												
Left school at 16 no qualifications				1.01	0.23,4.52	0.988	0.91	0.21,3.87	0.895	0.93	0.22,3.93	0.922
Left school at 16 with qualifications				0.79	0.35,1.81	0.58	0.78	0.35,1.78	0.560	0.81	0.35,1.84	0.607
Left school 17+ with qualifications				1	.	.	1	.	.	1	.	.
Currently 16				0.69	0.19,2.50	0.573	0.73	0.21,2.62	0.634	0.78	0.17,3.64	0.749
Ethnic group												
Non-white				1			1			1		
White				1.3	0.45,3.74	0.632	1.18	0.40,3.49	0.767	1.13	0.38,3.41	0.826
Family structure at 14												
Lived with both parents until 14				1			1			1		
Live with one or neither parents until 14				1.22	0.62,2.41	0.561	1.19	0.59,2.42	0.624	1.19	0.58,2.42	0.640
Main source of sex education												
Parents							1.45	0.52,4.03	0.475	1.47	0.53,4.12	0.459
School							1	.	.	1	.	.
Friends							0.83	0.36,1.92	0.661	0.82	0.35,1.90	0.642
Other							0.75	0.27,2.08	0.575	0.73	0.27,1.99	0.540

Discussion with parents about sex				
Discussed			1	1
Did not discuss			1.05 0.50,2.20 0.903	1.06 0.50,2.23 0.887
Duration sexually active				
0,1				1 . .
2,3				1.13 0.28,4.62 0.861
4, 5 yrs				1.04 0.23,4.63 0.960
6,7				1.36 0.33,5.67 0.672
8,11				0.9 0.18,4.34 0.891

Non-volitional sex

Table 44 shows the prevalence of non-volitional sex among female respondents. Respondents who were not sexually competent at first sex were 3.47 times more likely to have experienced non-volitional sex compared with those who were sexually competent at debut. Those who were under 16 at first sex were 3.63 times more likely to have experienced forced sex, compared to those who were 16 or older at sexual debut. Other factors associated with non-volitional sex were 'difficult' communication with parents about sex and longer duration sexually active, and not having lived with both parents at age 14.

The results of the multivariable regression analyses are presented in Table 45. In all four of the adjusted models, sexual competence and sex before 16 retained strong independent associations with non-volitional sex. As observed with several previous outcomes, there is evidence of mutual confounding between sexual competence and sex before 16; once adjusted for one another, the corresponding adjusted odds ratios are smaller in magnitude compared with the crude odds ratio. In the final model having been not sexually competent at first sex was associated with 2.91 ($p<0.001$) greater odds of experiencing non-volitional sex, while the corresponding adjusted odds ratio for sex before 16 as the predictor was 3.33 ($p<0.001$).

Table 44: Proportions and unadjusted odds ratios of Natsal-3 female respondents aged 16-24 at interview who report experience of non-volitional sex, by explanatory variables.

	Women					N (unweighted/ weighted)
	%	95% CI	OR	95% CI	p-value	
ALL	6.80	(5.57-8.27)				1582/882.71
Sexual competence						
Competent	3.22	(2.06- 4.98)	1			757/435.00
Non-competent	10.34	(8.32- 12.78)	3.47	2.08,5.78	<0.001	820/445.23
Age at first sex						
First sex ≥16	3.71	(2.55- 5.37)	1			952/564.40
First sex ≤15	12.27	(9.79- 15.27)	3.63	2.28,5.76	<0.001	630/318.31
IMD quintile						
1: least deprived	6.75	(4.22- 10.63)	1	.	.	266/153.30
2	5.78	(3.54- 9.29)	0.85	0.42,1.73	0.647	283/157.59
3	5.19	(3.13- 8.48)	0.76	0.37,1.54	0.440	293/173.32
4	8.15	(5.51- 11.92)	1.23	0.64,2.35	0.539	342/195.43
5: most deprived	7.70	(5.20- 11.24)	1.15	0.60,2.20	0.669	398/203.06
Parental social class						
No response	9.02	(5.17- 15.26)	1.32	0.69,2.53	0.398	161/ 81.99
Manual iv/v	4.66	(2.66- 8.02)	0.65	0.35,1.22	0.179	302/162.94
Non-manual i/ii/iii	6.98	(5.52- 8.78)	1	1.00,1.00	.	1062/613.12
Educational level						
Left school at 16 no qualifications	8.28	(4.04- 16.21)	1.13	0.51,2.51	0.770	85/ 36.31
Left school at 16 with qualifications	4.32	(2.46- 7.49)	0.56	0.30,1.06	0.074	276/136.94
Left school 17+ with qualifications	7.41	(5.93- 9.24)	1	.	.	1127/662.68
Currently 16	3.20	(0.97- 10.01)	0.41	0.12,1.42	0.162	89/ 43.57
Ethnic group						
White	6.48	(5.22- 8.01)	1	.	.	1420/775.58
Mixed	13.98	(7.16- 25.50)	2.35	1.08,5.12	0.032	63/ 34.73
Asian, Chinese, other	5.98	(1.71- 18.90)	0.92	0.25,3.44	0.900	55/ 39.14
Black	8.07	(2.83- 20.91)	1.27	0.41,3.92	0.680	42/ 32.21
Family Structure at 14						
Lived with both parents until 14	5.90	(4.47- 7.76)	1			942/560.32
One or neither parent	8.39	(6.40- 10.94)	1.46	0.97,2.20	0.069	639/321.14
Main source of sex education						
Parents	5.32	(3.04- 9.15)	0.91	0.45,1.82	0.785	240/129.14
School	5.83	(4.10- 8.23)	1	.	.	573/323.71
Friends	7.09	(4.72- 10.53)	1.23	0.69,2.19	0.476	430/234.69
Other	9.19	(6.40- 13.03)	1.63	0.96,2.80	0.073	334/191.94
Ease discussing sex with parents at age 14						
Easy with one/both	5.14	(3.50- 7.49)	1	.	.	513/284.10
Difficult	12.07	(7.24- 19.46)	2.53	1.26,5.08	0.009	136/ 78.83
Didn't discuss with either	7.05	(5.34- 9.25)	1.4	0.85,2.30	0.187	827/467.79
Varied depending on topic	5.30	(2.16- 12.44)	1.03	0.37,2.86	0.949	59/ 31.33
Duration sexually active						
0,1	1.39	(0.44- 4.30)	1	.	.	241/129.63
2,3	4.03	(2.35- 6.80)	2.98	0.82,10.89	0.098	369/211.39
4, 5 yrs	10.25	(7.39- 14.04)	8.12	2.41,27.35	0.001	387/226.41
6,7	8.01	(5.38- 11.77)	6.20	1.81,21.27	0.004	360/202.57
8,11	9.12	(5.91- 13.81)	7.13	2.05,24.86	0.002	225/112.71

Table 45: Multivariable logistic regression – outcome: ever experienced non-volitional sex (n:1507/846.88)

Outcome – non-volitional sex	Model 1			Model 2			Model 3			Model 4		
	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Sexual competence												
Competent	1			1			1			1		
Non-competent	2.92	1.69,5.06	<0.001	3.01	1.73,5.23	<0.001	2.91	1.65,5.13	<0.001	2.91	1.66,5.10	<0.001
Age at first sex												
First sex ≥16	1			1			1			1		
First sex ≤15	3.11	1.90,5.10	<0.001	3.86	2.31,6.46	<0.001	3.78	2.26,6.32	<0.001	3.33	1.98,5.60	<0.001
IMD quintile												
1: Least deprived				1	.	.	1	.	.	1	.	.
2				0.79	0.36,1.73	0.563	0.79	0.36,1.72	0.552	0.74	0.34,1.64	0.466
3				0.77	0.36,1.61	0.481	0.79	0.38,1.68	0.548	0.74	0.34,1.57	0.429
4				1.16	0.56,2.41	0.683	1.19	0.57,2.49	0.642	1.10	0.52,2.32	0.801
5: most deprived				1.18	0.55,2.51	0.673	1.2	0.56,2.57	0.638	1.11	0.51,2.42	0.788
Parental social class												
No response				1.31	0.63,2.71	0.466	1.29	0.63,2.64	0.478	1.34	0.66,2.74	0.415
Manual iv/v				0.59	0.31,1.14	0.115	0.6	0.31,1.15	0.121	0.56	0.28,1.10	0.092
Non-manual i/ii/iii				1	.	.	1	.	.	1	.	.
Educational level												
Left school at 16 no qualifications				0.6	0.26,1.39	0.231	0.62	0.27,1.41	0.254	0.58	0.25,1.34	0.204
Left school at 16 with qualifications				0.28	0.12,0.61	0.002	0.29	0.13,0.64	0.002	0.28	0.12,0.63	0.002
Left school 17+ with qualifications				1	.	.	1	.	.	1	.	.
Currently 16				0.27	0.08,0.99	0.048	0.26	0.07,0.97	0.046	0.7	0.17,2.95	0.625
Ethnic group												
White				1	.	.	1	.	.	1	.	.
Mixed				1.63	0.64,4.17	0.31	1.63	0.62,4.30	0.321	1.59	0.63,4.05	0.33
Asian, Chinese, other				1.42	0.37,5.53	0.612	1.16	0.29,4.68	0.831	1.17	0.25,5.45	0.837
Black				0.96	0.32,2.84	0.937	0.82	0.26,2.56	0.734	0.92	0.28,2.96	0.883
Family structure at 14												
Lived with both parents until 14				1			1			1		
Live with one or neither parents until 14				1.16	0.73,1.86	0.524	1.19	0.75,1.90	0.466	1.2	0.76,1.92	0.432

Main source of sex education								
Parents			0.87	0.39,1.92	0.724	0.91	0.40,2.05	0.82
School			1	.	.	1	.	.
Friends			1.07	0.57,2.03	0.828	1.02	0.54,1.95	0.941
Other			1.46	0.83,2.59	0.192	1.42	0.79,2.53	0.24
Ease discussing sex with parents at age 14								
Easy with one/both			1	.	.	1	.	.
Difficult			2.2	1.00,4.86	0.05	2.39	1.06,5.40	0.037
Didn't discuss with either			1.29	0.73,2.28	0.389	1.39	0.78,2.49	0.266
Varied depending on topic			1.05	0.37,3.04	0.922	1.12	0.37,3.33	0.842
Duration sexually active								
0,1						1	.	.
2,3						1.85	0.47,7.23	0.378
4, 5 yrs						5.20	1.35,20.08	0.017
6,7						3.84	0.97,15.19	0.055
8,11						3.00	0.73,12.30	0.127

Components of sexual competence measure

Extra analyses were undertaken (shown in Appendix 9), whereby each component of the sexual competence measure was entered into each fully adjusted regression model, to identify whether they were significant predictors of each outcome (sexual competence measure excluded from model). Figures 31 and 32 summarise the results of these analyses, alongside the results of the main analyses above, to show what aspects of first sex are independently associated with each outcome in a fully-adjusted multivariable regression models. Among women (Figure 31), at least one of the components of sexual competence is associated with each indicator of sexual health. The overall measure of sexual competence is associated with all five outcomes. Sex before 16 is associated with two of the three sexual health outcomes in the fully adjusted multivariable analyses. Among men (Figure 32), sexual non-competence was associated with HPV and low sexual functioning, and sex before 16 was associated with self-reported STIs and HPV, until adjustment for duration sexually active.

Figure 31: WOMEN: Predictive ability of individual items (y = association significant at $p < 0.1$ in final multivariable regression models)

Circumstances of first sexual intercourse	Self-reported STI	HPV	Low sexual function	Unplanned pregnancy	Forced sex
Autonomy of decision	y	y	y		
Contraceptive use			y		
Willingness	y		y	y	y
Timing		y	y	y	y
Competence	y	y	y	y	y
Occurrence before 16	y – until duration included			y	y

Figure 32: MEN: Predictive ability of individual items (y = association significant at $p < 0.1$ in final multivariable regression models).

Circumstances of first sexual intercourse	Self-reported STI	HPV	Low sexual function
Autonomy of decision			
Contraceptive use			
Willingness		y	
Timing			
Competence		y	y
Occurrence before 16	y – until duration included	y – until duration included	

8.1.4 Discussion

Summary of findings

These analyses find that, among sexually active 16-24 year olds, associations exist between sexual competence at sexual debut and a range of indicators of sexual health: testing positive for HPV, experiencing low sexual function, and among women specifically; self-reported STIs, having had an unplanned pregnancy in the last year, and the experience of non-volitional sex. The differences observed between the crude associations and the mutually adjusted associations suggest that there is some degree of mutual confounding at work, whereby sexual competence at first intercourse accounts for part of the association observed between sex before 16 and the outcomes, and vice versa.

Among the women in this study, those who were not competent at first sex were more likely to report having had an STI, and this association was independent of age at first sex. The association observed between sex before 16 and STIs in the bivariate analysis was found to be entirely due to those who were younger at first sex having been sexually active for longer, i.e. it is not engaging in sex at a younger age per se that is important for a heightened risk of STI acquisition, but being sexually active for longer, and so having more chance of exposure to infection. The association between sexual competence at first intercourse and STI diagnosis was retained even in the fully adjusted model.

No relationship between sexual competence at first sex and ever having an STI was observed among men. Sexual debut occurring before the age of 16 was associated with an increased risk of self-reported STIs, until duration sexually active was introduced into the model, whereupon age at first sex was no longer a statistically significant predictor of self-reported STIs, again suggesting that the predictive effect of younger age at first sex works through the length of time the respondent has been sexually active.

Both men and women who were not sexually competent at first sex were significantly more likely to have tested positive for HPV in the urine test carried out as part of the Natsal-3 survey. The inclusion of urine-tested HPV as an outcome was primarily in order to assess whether the associations identified with self-reported STIs were supported by analyses using an STI variable that did not depend on participants having sought testing. There is likely to be a substantial degree of misclassification error in analyses using the HPV outcome, particularly for male respondents, as the urine test used is known to have relatively low sensitivity among men (Bissett et al., 2011). This means that the prevalence of HPV in our male sample is likely to have been underestimated. Despite this, the findings from the regression analyses indicate an association exists between sexual competence and HPV both among women (supporting the

association identified with self-reported STIs) and men (perhaps suggesting that the lack of significant association with self-reported STIs is due to testing and reporting behaviours).

The regression models estimating the association between sexual competence at sexual debut and low sexual function in the last year identified a strong relationship, whereby young women and men who were not competent at first sex were twice as likely to have suffered from low sexual function in the last year. This association was not altered by the addition of the multiple explanatory variables into the model.

Female respondents who were not sexually competent at first sex were more likely to have had an 'unplanned' pregnancy in the year prior to interview, even after adjusting for the multiple covariates examined. Though having had sex before 16 was a stronger independent predictor of an unplanned pregnancy in the last year.

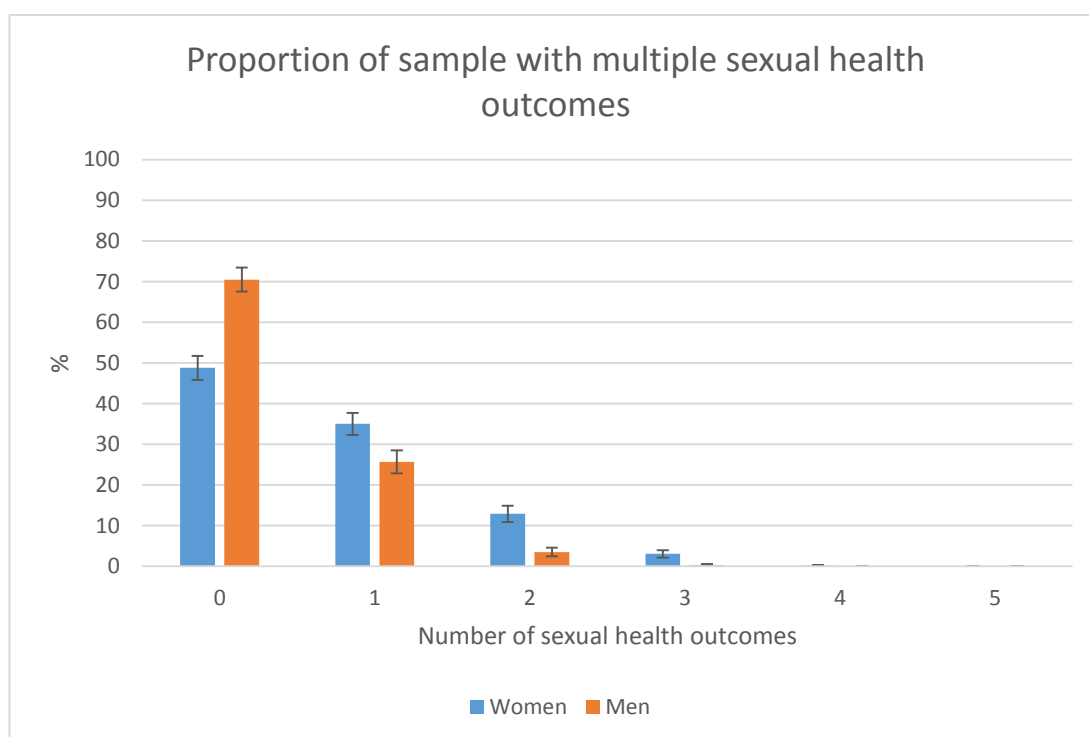
The final outcome explored was the experience of non-volitional sex. Female respondents who were non-competent at first sex were significantly more likely to report having ever experienced sex against their will. Having had sex before age 16 was also found to be predictive of non-volitional sex, independently of competence status, suggesting that both the *experience* and *age* at which first sex occurs are important factors in identifying those women who are more vulnerable to having sex unwillingly.

In the comparison of predictive ability of the each item that contributes to the measure of sexual competence, the sex before 16 variable, and the sexual competence measure itself, differential predictive patterns were identified (shown in Figures 31 and 32). While each separate item was predictive of at least one sexual health outcome among women, and age at first sex was associated with three outcomes: STI acquisition (until duration sexually active was added), unplanned pregnancy, and forced sex, only the measure of sexual competence was independently associated with all five sexual health indicators: self-reported STIs, HPV diagnosis, unplanned pregnancy, sexual functioning problems, and forced sex (Figure 31). This suggests that sexual competence at sexual debut is the more useful measure relating to first intercourse to identify women at greater or lesser risk of a broad range adverse sexual health outcomes. Among men, sexual non-competence was associated with two of the three outcomes explored: testing positive for HPV and experiencing low sexual function, while sex before 16 was associated with self-reported STIs and testing positive for HPV, until adjusted for the effect of duration sexually active.

The predictive capability of the measure of sexual competence for the five distinct indicators of adverse sexual health was not simply attributable to the same group of respondents reporting

each outcome. Despite the well-documented ‘clustering’ of risky sexual behaviours, Figure 33 shows that just over 10% of women experienced two of the sexual health outcomes, while 3% experienced three, and no women had experienced all five. Less than 5% of the male sample had experienced more than one of the possible three sexual health outcomes. This indicates that it is unlikely that each regression model is simply predicting the same group of people; the sexual competence measure is predictive of distinct indicators of sexual health status which are prevalent among distinct groups of people.

Figure 33: Proportion of sample with 0, 1, 2, 3, 4, or 5 sexual health outcomes



Extra analyses

Extra analyses were conducted to establish the robustness of the results. Analyses were conducted specifying more parsimonious models with selected explanatory variables to be included in the multivariable regression based on whether they were associated with the exposure (sexual competence) and the outcome in bivariate analyses - allowing for less restrictive p-value of <0.2-0.3 (shown in Appendix 8). Analyses were also repeated among 18-24 year olds – among whom a greater proportion have had sexual intercourse (Appendix 7). No substantial change in results of the regression models was observed in either of these scenarios so providing evidence for the stability of the results. However, among the 18-24 year old sample,

the association between sexual non-competence and unplanned pregnancy was slightly stronger (AOR: 2.27, $p=0.055$) than that observed in the current chapter among 16-24s.

Interpretation – contextualising with other studies

Studies finding associations between first sex experiences and subsequent sexuality

Only a few studies using data from the second National Survey of Sexual Attitudes and Lifestyles (Natsal-2), have conducted analyses with the current measure of sexual competence under study. Using a slightly different outcome measure to the current study, Mercer et al., (2005) identified that sexual non-competence at first sex was an independent and statistically significant predictor of having experienced ‘any’ (lasting more than one in month in the last year) or ‘persistent’ (lasting more than 6 months in the last year) sexual function problems among respondents age 16-44. Adjusted odds ratios ranged from 1.28-1.63 and 1.34-1.55 among male and female participants, respectively. In contrast to the results of this study, Wellings et al.’s (2001) analyses of the Natsal-2 data found no statistically significant association between sexual competence at first sex, and self-reported STIs, among 18-24 year old respondents. Similarly, no significant relationship was detected between sexual competence at first sex and abortion before 18; an outcome largely indicative of unplanned pregnancies. There are a number of possible reasons for the current study’s results differing from those of Wellings et al. (2001); the 10 year interval between the two surveys means that the cohorts examined may be distinct enough that there was simply no relationship between competence at first sex and subsequent outcomes in the earlier cohort. A perhaps more convincing explanation, however, is that the more complex regression analyses in this study have revealed important associations. Furthermore, the sample size of sexually active 18-24s respondents in Natsal-2 (approximately 800 of each gender) was considerably smaller than that in Natsal-3, therefore, the power to detect statistically significant associations will have been relatively lower. The trend observed in Natsal-2 in the difference in prevalence of STIs and abortion before 18 by sexual competence is consistent with results shown in the current chapter.

The current findings are broadly in line with other research concerned with contextual and affective factors relating to the first sexual encounter and how this relates to subsequent sexuality. While the following studies do not use the measure of sexual competence at sexual debut that was used in this research, these studies are believed to provide comparable and relevant results given their concern with the *experience* and *context* of sexual debut, as opposed to the age at which it occurred. The majority of the studies linking first sexual experience to

current sex life focus on outcomes such as current physical and emotional sexual satisfaction, and sexual adjustment; which are most comparable to our outcome of sexual functioning.

In an analysis of the retrospective reports of 475 Canadian undergraduate students (age range: 18-29), Reissing et al (2012) found that positive current sexual adjustment was significantly associated with positive affective reaction to first sexual intercourse among both men and women. Mediation analysis indicated that this relationship between affective reaction to first sex and current sexual adjustment was mediated by what the authors referred to as 'sexual self-efficacy', among both genders. However, the measure of self-efficacy was actually more reminiscent of a measure of sexual functioning: the *Sexual Self-Efficacy Scale for Female Functioning/ Erectile Functioning* (Bailes et al., 1998, Fichten et al., 1998). Therefore, it is more accurate to conclude from this study that the relationship between positive current sexual adjustment and a positive affective reaction to first sexual intercourse observed was mediated by sexual functioning.

Using data from the National Health and Social Life Survey conducted in the United States in 1992 with 3432 participants aged 18-59, Else-Quest et al. (2005) classified their participants as having had their first sexual experience in a negative context if any of the following criteria applied: first intercourse was forced; was with a blood relative; was with someone who paid the participant to have sex; the main reason the participant chose to have first intercourse was peer pressure or the influence of drugs or alcohol; or the participant reported having been touched sexually by an adult prior to puberty. Additionally, female respondents were also classified as having had a negative first sexual experience if first intercourse occurred with a stranger; someone they had just met; or with someone who they did not know well. Analyses found that a negative context of first sexual experience was associated with sexual dysfunction, more guilt around sex, poorer general health, STIs, and lower satisfaction with life.

The criteria used to categorise the context of first sexual experience in Else-Quest et al's (2005) study includes whether the participant was touched sexually by an adult prior to puberty. This is arguably a more extreme negative experience than that measured by questions used to construct the measure of sexual competence used in this thesis. The link between childhood sexual abuse and subsequent sexuality has been widely reported (Beitchman et al., 1992; Friesen et al., 2010; Paolucci et al., 2001). Around 16% of Else-Quest et al's (2005) participants reported having been touched by an adult prior to puberty, representing a substantial proportion of the participants who were identified as having a 'negative' context of first sexual experience. Similarly, 'forced' first sexual intercourse, and first intercourse with a blood relative, were used by the authors to classify context of sexual experience negatively; though far smaller

proportions of participants endorsed these two circumstances. Thus the *negative* context experienced by the respondents in Else-Quest's study seems to be tapping into circumstances that are far more extreme and abusive in nature than those measured by the sexual competence measure used in this thesis.

A study of 331 US undergraduate students also found evidence that the experience of first sexual intercourse has implications for subsequent sexual functioning (Smith and Shaffer, 2013). Respondents were asked to fill in an online diary within eight hours of any intimate interaction (defined as one in which the purpose was sexual arousal, not limited to sexual intercourse). The online diary asked respondents to rate how they felt during and after the interaction on 23 dimensions, which were reduced down to four factors using factor analysis: positivity during interaction (feeling intimate, desired, respected, loved, capable, and aroused), negativity during interaction (feeling pressured, incompetent, anxious, and detached), positivity after the interaction (feeling relaxed, good, and exhilarated), and negativity after interaction (regret, guilty, disappointed, and ashamed). In addition, questions related to physical and emotional satisfaction were asked. Similarly, participants were asked to rate how they felt during and after their first ever sexual intercourse on 26 dimensions, which were reduced down to four factors: anxiety (scared, nervousness during, nervousness after), afterglow (relaxed, content, good, excited, confident, proud, relieved), negativity (pressured, confused, detached, regret, guilt, disappointment, ashamed), and connection (intimate, desired, in control, respected, loved, capable, and aroused). Participants were also asked to rate their emotional and physical satisfaction at first sex.

The authors found that those who experienced greater physical satisfaction at first sex had current sexual interactions characterised by greater physical satisfaction. Similarly, emotional satisfaction at first sex was predictive of greater emotional satisfaction with current sexual interactions. Associations were also identified between the four derived factors: first sex negativity predicted current negativity during and after sexual interactions, while first time afterglow was associated with positivity after the current interactions. In general, this study found that even when controlling for overall sexual satisfaction, the experience and feelings about first sex had implications for the experiences of subsequent sexual interactions, with negative experiences of first intercourse being associated with negative feelings about current sexual encounters, and positive accounts of first intercourse being predictive of more positive experiences in current sexual interactions. These findings prompted the authors to speculate that "first-time sexual experience is so salient that it is related to future sexual satisfaction and functioning, specifically through long-lasting sexual schemas....any schemas and scripts

developed during the first time may continue to influence sexual intercourse later in life” (p.107-108).

Moore and Davidson’s (1997) study of 570 never-married college women identified that feelings of guilt about their first sexual intercourse experience were significantly associated with a greater likelihood of current psychological sexual dissatisfaction and guilt feelings about current intercourse. However, these findings should be interpreted cautiously – the study identified a number of family-related factors that were predictive of guilt feelings about first intercourse – though these were not adjusted for in the analysis of the relationship between first sex guilt and current sexual adjustment.

A study of 899 Greek women age 19-44 years identified that experiencing less pleasure than expected at first sex, and first sex being painful, were both associated with emotional and behavioural reactions to subsequent sexual relationships – whereby the women were more likely to experience fear and sexual unresponsiveness in later sexual encounters (Papaharitou et al., 2011). However, again this study was lacking methodologically, with no statistical adjustment for potential confounders to the relationships observed.

All of the above studies rely on retrospective reporting, therefore the associations observed may be a product of recall bias; respondents who currently enjoy a positive and well-adjusted sex life may be more inclined to recall their first sexual experiences in a more positive light.

One component of the sexual competence measure is contraceptive protection, and two of the outcomes studied – STIs and unplanned pregnancy – are directly relevant to condom and contraceptive use. Along with the links identified between affective reactions to first intercourse and subsequent sexual health, relationships between protective contraceptive behaviours at first sex and subsequent sex have also previously been identified (Shafii et al., 2004; Shafii et al., 2007; Stulhofer et al., 2010). Furthermore, a study by Whitten et al., (2003) found that among a sample of US adolescents and young adults, emotional reactions to intercourse were associated with STI diagnosis; respondents were asked about how often they experienced certain emotional reactions after sex, such as feeling good about themselves after sex, feeling comfortable during sex, and feeling angry after sex. Those who reported more negative emotional reactions had significantly greater odds of being diagnosed with an STI.

Explaining the relationship between sexual competence at first sex and subsequent sexual health

Having detected associations between sexual competence at sexual debut and subsequent sexual health in this study, we must consider whether the experience of first sex is likely to influence sexual health status. Or alternatively, whether by assessing the context of first sex, we simply identify persons who are at greater or lesser risk of threats to sexual health due to some unmeasured common background factor or personal tendency.

Possible explanations for the relationship observed include:

- 1) The context and experience of sexual debut influences subsequent sexual behaviour, for example, through the establishment and/or maintenance of sexual scripts or schemas or 'habits'.
- 2) Unmeasured/unknown background factors account for the relationships observed:
 - a. Negative reactions and context of sexual debut and subsequent encounters could be part of a long term pattern, resulting from childhood sexual abuse or early forced intercourse.
- 3) Underlying personal-level factors account for the relationships observed:
 - a. The negative context of first intercourse might indicate a low level of self-efficacy for refusing unwanted sex, which continues to influences subsequent encounters.
 - b. Personality factors, such as sensation-seeking and/or impulsivity could account for sexual non-competence at first intercourse, and subsequent sexual behaviour threatening sexual health.

A causal relationship

Despite the difficulties in establishing causal direction, even when dealing with occurrences for which timing is known, many researchers do interpret the associations they find between the nature of first sex and subsequent sexual health status as causal, as illustrated by the following extracts from their work. The authors emphasise the role of early sexual experiences in a process of learning, placing individuals on certain trajectories informed by their prior sexual experiences, due to the adoption of particular 'scripts' or 'schemas' related to sexuality.

Reissing et al (2012):

“initial sexual experiences may affect an individual’s sexual development by either confirming or challenging existing beliefs about sexuality and the self as sexual (sexual self efficacy) and by setting the stage toward an approach or avoidance attitude (sexual aversion) toward future sexual experiences, which, in turn, may further determine a positive or negative trajectory for sexual development and adjustment.” (p.29).

Morgan and Zurbriggen (2007):

“Because early relationships are a place to learn how to act in sexual relationships, enacting traditional gendered roles in early heterosexual dating relationships could have long-term effects. Once both parties involved have confirmed and experienced behaviours in compliance with traditional norms, these patterns of sexual and romantic interactions can become solidified and re-enacted in future relationships. This re-enactment is frequently to the detriment of both partners, but particularly so for women because sexual encounters that follow these patterns compromise women’s sexual agency and ignore their sexual desire.” (Morgan and Zurbriggen, 2007) p. 537

Else-Quest et al (2005):

“Early sexual experiences are important in sexual development because they influence one’s sexual script development...Script theory contends that sexual scripts, which are learned schemas about sex, provide meaning for the internal sensations we feel during sexual desire and arousal. Scripts organise the order of sexual acts and help the individual decode novel situations. They also set limits on sexual responses and help a person understand the socially appropriate behaviours and responses” (p. 102)

Smith and Shaffer (2013):

“Any schemas and scripts developed during the first time may continue to influence sexual intercourse later in life.” (p. 108)

The research literature concerned with the relationship between protective contraceptive behaviours at first sexual intercourse and subsequent sexual encounters have posited the role of habit formation in explaining this association (Shafii et al., 2004, Shafii et al., 2007). One study attempted to explain the mechanism underlying the positive association between condom use at first sex and condom use at subsequent sexual encounters (Stulhofer et al., 2010). An online survey of 1145 sexually active individuals aged 18-65 was conducted in Croatia; participants were asked about condom use at first sex and at most recent sex, along with scales to assess participants’ reasons or motivational determinants for condom use. These scales were developed to tap into three possible explanations: 1) the ‘normative hypothesis’ which suggests that “regular condom users can be distinguished from their peers by their strong adherence to social norms that reflect expectations that sex would (and should) not take place without the use of a condom”, 2) the ‘calculative hypothesis’, that “condom use is governed by (quasi) rational decision-making....a complex, highly subjective, and contextual calculation of costs and benefits of using condoms”, 3) the ‘habit formation hypothesis’, “regular condom use does not

depend on positive norms, risk calculations, or communication skills, but is a habit that develops early on (for various reasons, e.g., a strong fear of unwanted pregnancy) and is sustained by the force of non-deliberation” (p. 2081). Analyses were conducted to examine whether the association between condom use at first sex and at most recent sex could be best predicted by any of these three motivational determinants. Adjusting for age, gender, and relationship status, condom use at both occasions (first and most recent sex) was positively associated with higher scores on the Habitual Condom Use Scale, while higher scores on the Calculative Condom Use Scale were associated with a lower likelihood of having used condoms at both sexual encounters; suggesting that in this study population, the habitual condom use hypothesis was supported.

Shafii et al, (2004) also suggest the role of habit formation in the link between condom use at sexual debut and condom use at subsequent encounters:

“We theorize that when a teenager uses a condom at their sexual debut, the foundation for a habit of condom use is established. The logic is that for adolescents whose initial experience of sexual intercourse includes using a condom, condoms become a routine part of sex; we expect, therefore, that these adolescents will be more likely to regularly use condoms in their subsequent sexual encounters” (p. 366).

Their analyses offer some support for this hypothesis, as they find that the two-fold increase in the odds of using a condom at most recent sex when a condom was used at sexual debut, is retained even when adjusting for multiple potential confounders such as, measures of risk-taking behaviour, attitudes (including towards pregnancy and HIV), risk perception, sex education, self-efficacy with birth control, and age at first sex. In accordance with research concerned with association between affective experiences of first sex and subsequent sexual behaviour and health, is the hypothesis that certain patterns of behaviour are established during the first sexual experiences and continue into future sexual encounters. Whether referred to as a ‘script’, a ‘schema’, or a ‘habit’, these studies all argue effectively the same point.

As discussed previously, the body of literature regarding the relationship between the experience of first sex and subsequent sexual behaviour and health is limited in size, but also, the methodological approach of these studies do not provide the robust empirical evidence to unequivocally support the causal hypothesis presented by the authors. All of the studies examining this association, including the present analyses, rely on observational data from which causality cannot be ascertained given the possibility for unmeasured confounders.

Individuals themselves linking their first experience of sexual intercourse to their current sex life

Only two studies were identified which provided respondents with the opportunity to express their own opinions about whether their first sexual experience had had any kind of impact on their current sexual life.

Reissing et al's (2012) respondents were also asked to rate the degree to which their first consensual intercourse experience changed the way they think or feel about their sexuality, with possible answers based on a Likert scale from 1 (very negatively) to 7 (very positively). While 37% of respondents reported no change in the way they view their sexuality, 15% reported that their first intercourse experience negatively changed the way they view their sexuality, and 47% reported a positive change. The direction of change reported was significantly associated with contextual aspects of the first sexual intercourse; men were more likely to report positive change if their first experience was positive and they had no feelings of regret. Female respondents were more likely to report positive change if they rated their first intercourse experience positively: if they did not report feelings of regret, if they were in a committed relationship at the time of first sex, if they had not used drugs or alcohol, and if they had experienced orgasm. However, Reissing et al's. (2012) findings are based on a rather leading question, in that asking participants to *rate the degree to which their first sexual intercourse changed the way they think or feel about their sexuality* is loaded with an assumption that such an effect exists, which could bias the answers provided.

Heinrichs' (2007) conducted qualitative interviews with 17 pre-menopausal women in long-term relationships based on the overall question of "what helps or hinders your sexual self-esteem?". The author used the Critical Incident Technique, to identify the critical experiences of respondents that were important in the development of their sexual self-esteem. Four of the participants recounted that the choices they had made about when to transition into sexual activity had been positive and had a positive impact on their sexual self-esteem. Participants characterised their first sexual experience as being positive when it was "filled with love, it was a choice made by both partners, and there was no pressure in the relationship for the participant to become sexually active" (p.67). One participant recounted:

"For me my first sexual experience was a positive one, and that impacted my sexual self-esteem lots and that was the same with my husband. It was many years ago and that was a positive thing for me because along with us being sexually active, there came a lot of love and that was really positive for me. It made me feel good about myself, in my self-esteem and in my sexual self-esteem." (p.67)

Potential for confounding

Despite the cited research hypothesising about the possible mechanisms underlying a *causal* link between the circumstances of first sex and subsequent sexual health and behaviour, it must

be noted that all of these studies are based on observational data, and any associations identified may actually be due to unknown and/or unmeasured confounders. Even in studies which control for a multitude of covariates of potential importance, these are measured at the same time as the data regarding first sex and subsequent sexual health is collected. In order to truly measure and adjust for confounders, this information would be better collected prior to the transition in to sexual activity, to avoid the risk that the event of embarking on sexual activity itself may have affected the measurement of these factors (though this is not such an issue for stable constructs, such as parental SES, gender etc). While multiple potential confounders of the relationship between sexual competence at sexual debut and subsequent sexual health were adjusted for in the current study, as is often a limitation with observational data, there remain potential known and unknown confounders which analyses were not adjusted for.

Sexual experiences prior to first intercourse

Childhood sex abuse and early forced intercourse are both experiences which could have preceded and influenced sexual competence status at first volitional intercourse, and continued to influence sexual behaviour and health into adulthood (Meston et al., 2006; Leonard and Follette, 2002).

Where possible, precautions were taken in the current analyses to account for these potential influences. The measure of sexual competence aims to assess first consensual intercourse and so, any participants who reported that their first sex was ‘forced’ (as distinct from those who were ‘less willing’ than their partner) were not included in any analyses, as a forced first sexual encounter is intrinsically different to consensual encounter characterised by ‘non-competence’.

Further analyses were conducted adjusting for two extra variables – sex before 13 and the experience of non-volitional sex prior to first consensual intercourse (Appendix 10). Respondents were asked the competency-based questions regarding their first sexual intercourse which occurred after turning 13, to safeguard against asking about early sexual experiences which were considered likely to be non-consensual. However, data was available regarding whether the respondent had reported an occasion of sexual intercourse prior to age 13, allowing a variable indicating the experience of sex at 12 or younger to be derived.

The question asking respondents whether they had ever been made to have sex against their will (termed ‘non-volitional’ sex) was followed up with question asking *when* this had last occurred. Using this information and the respondents’ reported age of first sex, we were able to identify respondents who had been forced to have sex prior to their reported first consensual sexual intercourse. Unfortunately, this question only asked specifically about the age at which

forced sex was *most recently* experienced, therefore, it is possible that there would be unidentified respondents that had experienced forced sexual intercourse prior to the sexual debut described in the sexual competency questions.

Analyses adjusted for these two derived variables (sex before 13, and experience of non-volitional sex prior to first consensual intercourse) are presented in Appendix 10. The decision to not include these variables in the final main analyses was due to a number of factors: few respondents had experienced these two factors; including these variables caused a number of participants (>50) to drop out of the regression models, due to missing data; and the inclusion of these variables made no substantial difference to the associations observed.

The Natsal-3 questionnaire included no questions relating to whether respondents had experienced any kind of unwanted sexual touching during childhood prior to their sexual debut, so the possibility of an inappropriate and non-consensual introduction to any kind of sexual experience, before the encounter at which sexual competence was measured, cannot be ruled out.

Respondents were not questioned about the sexual activities that they may have engaged in prior to their first sexual intercourse, i.e. non-coital sexual activities. However, young people often engage in such activities before having sexual intercourse for the first time (Schwartz, 1999; Halpern-Felsher et al., 2005; O'Sullivan and Brooks-Gunn, 2005). A qualitative study of British adolescents identified a normative sequence in which young people expected to engage in certain activities – (vaginal) fingering, 'hand jobs', 'blow jobs', 'licking out' and finally, 'sex' – vaginal intercourse (Lewis et al., 2013). The young participants described why they expected to engage in non-coital practices before 'losing their virginity' with reference to ideas that non-coital practices can "help develop and demonstrate sexual skill, prepare girls for vaginal intercourse", enable learning about partnered sexual pleasure and are part of developing intimacy in a relationship" (p. 5). Based on these findings, it is possible that the experience and nature of pre-coital sexual activities may have implications for the experience of, and context within which first intercourse occurs, and therefore may behave as a confounder to the associations observed in this study. However, penetrative intercourse is commonly regarded as what constitutes 'proper sex' – during which manhood is 'achieved' and virginity 'lost' (Holland et al., 2000), with the pre-coital activities considered to be 'building-up to' intercourse (Lewis et al., 2013), and so, it is also possible that it is specifically first intercourse that is the most salient 'first' in affecting subsequent sexual trajectories.

Self-efficacy

Self-efficacy refers to “beliefs in one’s capabilities to organise and execute the courses of action required to produce given levels of attainments” (Bandura, 1998) (p. 625). Self-efficacy has been linked to a number of sexual behaviours including contraceptive intentions and use (Wulfert and Wan, 1993; Baele et al., 2001), and engaging in sexual activity during adolescence (Castro et al., 2011). Sexual self-efficacy could play a role in determining the sexual competence status of young people at first sex; young persons with a higher degree of self-efficacy may be better equipped to resist unwanted sexual encounters and to use contraceptive protection when sex does occur, and these higher levels of self-efficacy may continue to positively determine sexual behaviour and sexual health in subsequent relationships.

Self-efficacy may only act as a confounder in the relationships observed if it has been firmly established prior to first sex. However, in discussing the sources of self-efficacy beliefs, Bandura (1995) identifies four main forms of influence and argues that the most effective way of creating a strong sense of efficacy is through ‘mastery experiences’ as they provide “the most authentic evidence of whether one can muster whatever it takes to succeed” (p. 3). These successes can build a robust belief in one’s personal self-efficacy, whereas failures can undermine it, particularly if those failures occur before one’s sense of self-efficacy is firmly established. According to Bandura (1995), “developing a sense of self-efficacy through mastery experiences is not a matter of adopting ready-made habits. Rather, it involves acquiring the cognitive, behavioural, and self-regulatory tools for creating and executing appropriate courses of action to manage ever-changing life circumstances” (p. 3). While Bandura refers to self-efficacy in general, as opposed to that specific to sexuality, these ideas could also link in with causal mechanism hypotheses discussed above. Consistent with the idea that young people may establish certain ‘scripts’ or ‘habits’, having a sexually competent first sexual experience may act as a ‘mastery experience’ through which a belief in one’s sexual self-efficacy to resist unwanted sexual advances and to use contraceptives is established.

Personality traits

A possible confounder of the relationships identified which is conspicuously absent from any of the research linking the nature of first sexual intercourse to subsequent health and behaviour, including the current study, is that of personality traits. Specifically, sensation-seeking and impulsivity have both been linked to risky sexual behaviours (Hoyle et al., 2000; Charnigo et al., 2012), and if these individual characteristics are considered to be stable through the time period under study (i.e. early adolescence into adulthood) it is conceivable that these particular character traits are responsible for the relationships observed; that is, perhaps young people who have a tendency for ‘sensation-seeking’ are more likely to transition into sexual activity in

an unsafe or non-competent way, and these same individuals may continue to engage in riskier sexual activities later in life. For this potential mechanism to be rigorously tested, one would need longitudinal data that measures personality characteristics far prior to sexual activity beginning, with continued measures of these traits into adulthood, along with the appropriate measures of sexual activity and health.

Using data from the longitudinal cohort study conducted in New Zealand (Dunedin Multidisciplinary Health and Development Study), Caspi et al., (1997) examined whether personality dimensions measured at age 18 were associated with various health-risk behaviours at age 21, including that of 'unsafe sex' defined as those who had five or more partners in the year prior to interview and reported never or rarely using condoms. Respondents who scored higher on the 'negative emotionality' dimension (indicating a low general threshold for the experience of negative emotions such as anxiety and anger, and a tendency to break down under stress) were significantly more likely to have engaged in unsafe sex behaviour. Additionally, respondents who scored higher on the 'constraint' dimension (indicating the tendency to endorse conventional social norms, avoid thrills, and act in a cautious and restrained manner) were significantly less likely to have engaged in unsafe sexual behaviour in the year prior to the age 21 interview. The temporality of this relationship was backed up by further analyses showing that an *undercontrolled* or *confident* temperament measured at age 3 was also associated with the health-risk behaviours – a relationship mediated by the age 18 personality measures.

However, it has been suggested in a recent study that the relationship between personality traits and sexual behaviour is far from straightforward, with attention given to the interactions at play between character traits and situational factors. A study of over 7,000 discrete sexual events collected from a community sample of 1,946 young adults examined the individual and joint contributions of personality, situational, and relational factors on risky sexual behaviour (Cooper, 2010). The sexual behaviours under examination and considered as 'risky' were: 1) alcohol use prior to intercourse/drunkenness during intercourse, 2) sex with a high risk partner, such as someone who had ever been paid for sex, had an STI, injected drugs, 3) low level of discussion about risk prior to sexual intercourse with partner, 4) condom and birth control non-use, and 5) having sex with a 'casual' partner. Analyses found that risky sexual behaviours exhibit reliable variability between persons, as well as variability within a person over time and across situational and relationship contexts. Of particular note, was that these risky sexual behaviours varied approximately three times as much within a person across time as they do between persons; a finding that remained even after adjusting for the effect of age – which was judged to be an important source of within-person variability in this study. The majority of the

associations identified between personality traits and sexual risk behaviour differed according to both situational factors and relationship commitment contexts, suggesting that most character traits do not predispose individuals to increased risk behaviours in a global or typical way. Conversely, the effects of situational factors and relationship commitment context on sexual risk-taking were moderated by individuals' personality traits, indicating that specific sexual contexts do not invariably lead to increased sexual risk taking.

Cooper (2010) also notes that the five 'risky' sexual behaviours under examination differed in terms of the personality trait profiles they were predicted by, suggesting that the underlying mechanisms linking personality to these behaviours differs between the five behaviours examined. No single personality trait, or particular personality profile, predicts engagement in each of the multiple sexual behaviours that were considered 'risky'.

Therefore, while it is conceivable that personality traits may contribute to some of the relationships observed between the experience of sexual debut and subsequent sexual health indicators, given the findings of Cooper's (2010) study, it seems unlikely that a certain character trait would explain the associations observed between sexual competence at debut and several distinct outcomes: STIs, unplanned pregnancy, low sexual function, and non-volitional sex. Moreover, if these relationships were entirely due to personality, it would not be expected for the patterning of nature of first sex to differ significantly according to social/cultural factors – as found in chapter 7 concerned with the predictors of sexual competence, along with the body of research literature focusing on the predictors of certain contexts of first sex (Else-Quest et al., 2005; Reissing et al., 2012; Smith and Shaffer, 2013).

There is also uncertainty regarding how personality traits might affect the measure of sexual competence; the answers to the questions used to construct the measure are likely to depend not only the actual context of first sex, but also how it is interpreted and reflected on by the individual. While personality may influence the behavioural context of first sex in a semi-predictable way, the interpretation of events may also be influenced by personality traits; Horvath and Zuckerman (1993) found that after engaging in high-risk activity, high sensation-seekers evaluated the activity as less risky.

The relationship between personality traits and sexual behaviour has mainly been studied using cross sectional data, limiting the conclusions that can be drawn about the direction of causality. It could be that personality traits set processes into motion that cause people to engage in risky sexual behaviour, or that, having engaged in risky sexual behaviours may affect one's personality, or at least the way in which an individual responds to personality-measurement instruments.

8.1.5 Limitations

Several limitations must be noted when interpreting the results of the current chapter. Any inference of causality must be considered with caution given both the cross-sectional nature of the study, and the potential for unknown and/or unmeasured confounders, which could account for the observed association between sexual competence at sexual debut and indicators of sexual health. The role of the alternative explanatory variables discussed above, such as prior sexual experiences, self-efficacy, and personality traits, cannot be quantified as they were unmeasured in the survey.

Reliance on retrospective reporting in the Natsal-3 survey also has the potential to introduce recall bias. The time between the occurrence of first sexual intercourse and being interviewed can be as long as ten years among respondents aged 16-24. The interpretation of events that take place early in life is likely to be shaped by subsequent experience, and so cannot be construed simply as rationalisation of past events. Giddens (1992) suggests that one's recollection of sexual encounters is part of the "narrative reconstruction" of the past within which we make sense of our lives, meaning that what happens after first intercourse may be just as important as what happened at the time in influencing subsequent feelings. This is not necessarily an inherent weakness of the study or the measure of sexual competence; we are not concerned with describing the experience as a fixed and observable reality, but in terms of the way in which men and women construct and reflect on first sexual experience. Nevertheless, the quality of one's current sex life is likely to colour recollections of past sexual experience, whether in an unfavourable or favourable light and could introduce bias in the observed associations between the nature of first sex and subsequent sexual health status.

Finally, the response rate to Natsal-3 was 57.7% (Erens et al., 2013), potentially limiting the representativeness of the findings presented. Although data is weighted on demographic characteristics in order to more closely reflect the wider British population, it is possible that the individuals who agree to partake in a survey of this nature differ from those that do not. However, some have argued that given that generally non-response rates are no greater for sex research than those for studies of other sensitive issues, hence the *sexual* nature of the survey per se may not actually bias the response (Biggar et al., 1989; Bajos et al., 1992). The Natsal-3 response rate was similar to that of other major social surveys undertaken at the same time (Craig and Mindell, 2011; Park et al., 2012), perhaps suggesting that the *sexual* focus of the survey is not responsible for the limited rate of response.

8.1.6 Conclusions and Implications

In contrast to the prevailing focus on the factors associated with ‘early’ sexual debut, an increasing body of research has investigated the importance of the circumstances of, and feelings about, first sex and their potential role in shaping the subsequent sexual trajectory. This study contributes to this emerging literature and provides evidence for the utility of a measure of sexual competence at sexual debut in identifying those at greater risk of poor sexual health, independently of the effect of age at first sex.

In terms of identifying individuals at heightened risk of poor sexual health, our unadjusted analyses found sex before 16 to be associated with self-reported STIs and testing positive for HPV among both genders, and unplanned pregnancy and non-volitional sex among women. Therefore, the more conventionally and easily measured age-at-first sex remains useful in distinguishing young people at relatively greater risk of certain aspects of poor sexual health – though it shows no association with low sexual functioning. Settersten Jr and Mayer (1997) argue that age itself is an ‘empty’ variable given that one rarely assumes that age per se causes a behaviour; it is often used as a proxy measure of what is thought to be important, for example, physical development and emotional maturity. In conceptualising the experience in a more nuanced way, the sexual competence measure may offer a more meaningful means by which timing of sexual debut might be assessed for appropriateness in a public health context.

It seems unlikely that young people have a blank sexual canvas before their first sexual intercourse, and that from then on, their sexual trajectory can be traced back to the first experience. We know from the vast body of literature that sexual behaviour is influenced by a huge number of factors at the societal, familial, and individual level, with no single factor accounting for much of the large variation in sexual behaviour observed. It is possible, however, that the nature of the first sexual experience is one of the many influences at work in contributing to the patterning of subsequent experience.

Many sexual behaviour orientated interventions, particularly sex and relationship education, have been concerned with delaying when young people become sexually active, though evidence for the effectiveness of these efforts on temporal delay is mixed (Kirby et al., 2007; Wight et al., 2002; Kirby, 2001). Sexual competence at first sex may represent an alternative goal and outcome measure for interventions aiming to improve sexual health – potentially one that is more agreeable to young people themselves, in that the focus is shifted from the

problematisation of adolescent sexual intercourse, to a more accepting effort concerned with transitioning into sexual activity in a healthy and positive manner defined by circumstance rather than age. If we accept that optimising the experience of first sex in itself is a worthwhile goal, then the chance that these efforts may also translate into better subsequent sexual health serves to strengthen the argument for a shift in the educational and research paradigm concerned with young persons' sexual behaviour and health.

UK government guidance states that Sex and Relationship Education (SRE) should enable young people to maintain their physical sexual health and also equip them to handle the relational and emotional aspects of sexual activity, with reference to negotiation skills and resisting pressure (Department for Education and Employment, 2000). It is in relation to the latter that school provision of SRE is currently lacking (The Office for Standards in Education, 2010), despite young people themselves reporting a desire for greater focus on the relational aspects sexual activity (Macdowall et al., 2006).

The components which make up the measure of sexual competence have already informed educational and advisory materials aimed at young people which encourage the consideration of the ideal circumstances and conditions for first having sex, as opposed to the right age at which to do so. As described in Chapter 4, the UK government Teenage Pregnancy Strategy media campaign: *Sex. Worth Talking About*, for example, features an online page entitled *Are you ready for sex?* (NHS website, 2009), which advises young people to consider whether they feel under pressure from their partner or are trying to impress their friends, whether they might regret it afterwards, and whether they are equipped with reliable contraception. This is good example of how this novel measure can be used practically to support young people in their decision to become sexual active. The finding of an association between 'sexual competence' at first intercourse and subsequent sexual health goes some way towards providing the empirical basis for, and so ratifying, an emphasis on comprehensive sex education that provides young people with the skills required to embark on sexual activity which is physically, emotionally, and socially healthy.

8.2 Summary of Chapter 8

- **Sexual (non-)competence at first intercourse is independently associated with several indicators of sexual health: testing positive for HPV and experiencing low sexual function among men and women, and unplanned pregnancy, non-volitional sex, and self-reported STIs among women.**
- **These findings provide further evidence for the external-criterion validity of the measure of sexual competence, and also suggest the potential utility of this measure in identifying those at heightened risk of a broad range of adverse sexual health outcomes.**

9. Chapter 9: Using in-depth interviews to explore how young people formulate their answers to the Natsal-3 questions about first intercourse

9.1.1 Introduction

A small exploratory qualitative component was conducted as part of this PhD for two main reasons: 1) in order to gain an insight into how Natsal-3 participants went about answering the questions that make up the 'sexual competence' measure and 2) so that I, as a researcher, could gain experience in conducting and analysing qualitative interviews.

The survey questions which are used to compile the measure of sexual competence span concepts of willingness, autonomy of decision, evaluation of timing, and contraceptive use and, as is necessary for survey questions, are closed-end and relatively crude. Therefore, this qualitative follow-up study focused on how Natsal respondents interpreted these questions and reflected on their own experiences to formulate their given answer.

9.1.2 Methods

Recruitment

During the Natsal-3 interview, respondents were asked whether they would be willing for a researcher to contact them again about taking part in a further interview. This question was worded as follows:

'It is possible that we may want to contact you again to obtain further information about some of the topics covered in this study. Would you be willing for a researcher from the study to contact you again about taking part in another interview?'

Those who responded yes to this question comprised the potential sample from which participants for my qualitative work were drawn. Given the focus of my quantitative work on respondents aged 16-24 at interview, my qualitative sample was also restricted to the same age group.

Participant contact details were acquired from the National Centre of Social Research (NatCen) and were held by a member of the core Natsal team at LSHTM. Individuals were invited to take part in the interview by letter, which was followed up about a week later with a telephone call giving more details about what was involved. Due to an ethics requirement of the original Natsal survey, the first contact made to the potential respondents (letter and a follow-up phone call) were made by a Natsal team member, rather than myself. After verbal confirmation that the individual was willing to participate, their contact details were passed to me so that I could make another phone call to arrange a suitable time, date and venue for an interview. Recruitment

continued until the final sample (detailed below) was achieved. The original qualitative component protocol can be found in Appendix 2.

Sample

The sample was selected purposively to include respondents who gave a range of different answers to the four survey questions under study. The only other prescriptions made were to have a range of ages at first sex and that the sample should be made up of an equal number of men and women. Originally it was planned that after initial 12 interviews, two more respondents would be selected according to any suspected data gaps, bringing the total number of interviewees to 14, however due to time and monetary constraints, interviewing stopped after the initial 11 respondents (characteristics of whom are detailed in Figure 34). Respondents were from a range of geographical regions, including South England, the Midlands, North England, and Wales.

Figure 34: Description of sample interviewed based on Natsal-3 data

Pseudonym	Age	Gender	Equal willingness	Autonomous reason	Right time	Contraception	Age at first intercourse
Claire	21	Female	1	1	1	1	15
Suzy	20	Female	1	1	1	1	15
Katie	22	Female	1	1	1	1	16
Tom	26	Male	1	1	1	1	16
David	22	Male	1	1	1	1	16
Sandra	24	Female	1	1	0	1	17
Emily	26	Female	0	0	0	1	14
Corinne	26	Female	0	1	1	1	17
Ben	26	Male	1	1	0	1	15
Owen	21	Male	1	1	0	1	14
Nic	22	Male	0	1	0	1	16

Conduct of the interviews

All interviews were carried out by Melissa Palmer in the interviewees' home at a time convenient to them. All but one of the interviews was conducted on a one-to-one basis – the exception was a male respondent whose partner and newborn baby were present. Though it would have been more methodologically sound for every interview to have been on a one-to-one basis, it would have been unethical and impractical to ask the mother and baby to leave – though their presence did undoubtedly have an effect on the interview flow and content as it seemed that the male respondent felt the need to provide reassurance to his current partner about the status of their relationship.

Data collection

The interview essentially entailed two components; firstly respondents were asked to give as full account as possible of the first time they had sex; and secondly they were presented with each of the four Natsal questions regarding the circumstances of their first sex one-by-one, were asked to answer the question, and then cognitive interviewing style probes were used to gain insight into how and why participants gave the answer that they did.

The Natsal questions were given to the respondents on cards, so that they could read the question themselves, and hold on to the card to allow greater consideration throughout the interview. At the end of the interview, when the respondent had all four cards in front of him/her they were asked if they felt there was anything missing in terms of what they thought about when evaluating their first sex, and were also asked to place the cards in order in terms of their relative importance for the way respondents felt about their first intercourse now.

While the main aim of the interview was to explore how respondents went about formulating their answers to the Natsal questions, there were two subsidiary a priori points of interest: how participants felt about chronological age in defining the appropriate timing of first sex, and whether the physical experience and enjoyment derived from first sex was important in the way they evaluated their first time. Therefore, whenever age came up spontaneously in interview, the interviewer asked “do you think there is a good or ideal age at which to have sex?”

The importance of enjoyment in the experience of first intercourse was only asked about at the very end of the interview, after the respondent had been given the opportunity to volunteer any other aspects, not included in the Natsal questions, which they considered to be of relevance to their overall evaluation of first intercourse. In order to facilitate the discussion about enjoyment, after completing the ordering of the question cards exercise, they were asked to imagine that there was a fifth card asking about ‘enjoyment’, to add that to the sequence, and explain their reasoning.

The interview topic guide can be found in Appendix 1. All interviews were audio-recorded – no participants declined to be recorded.

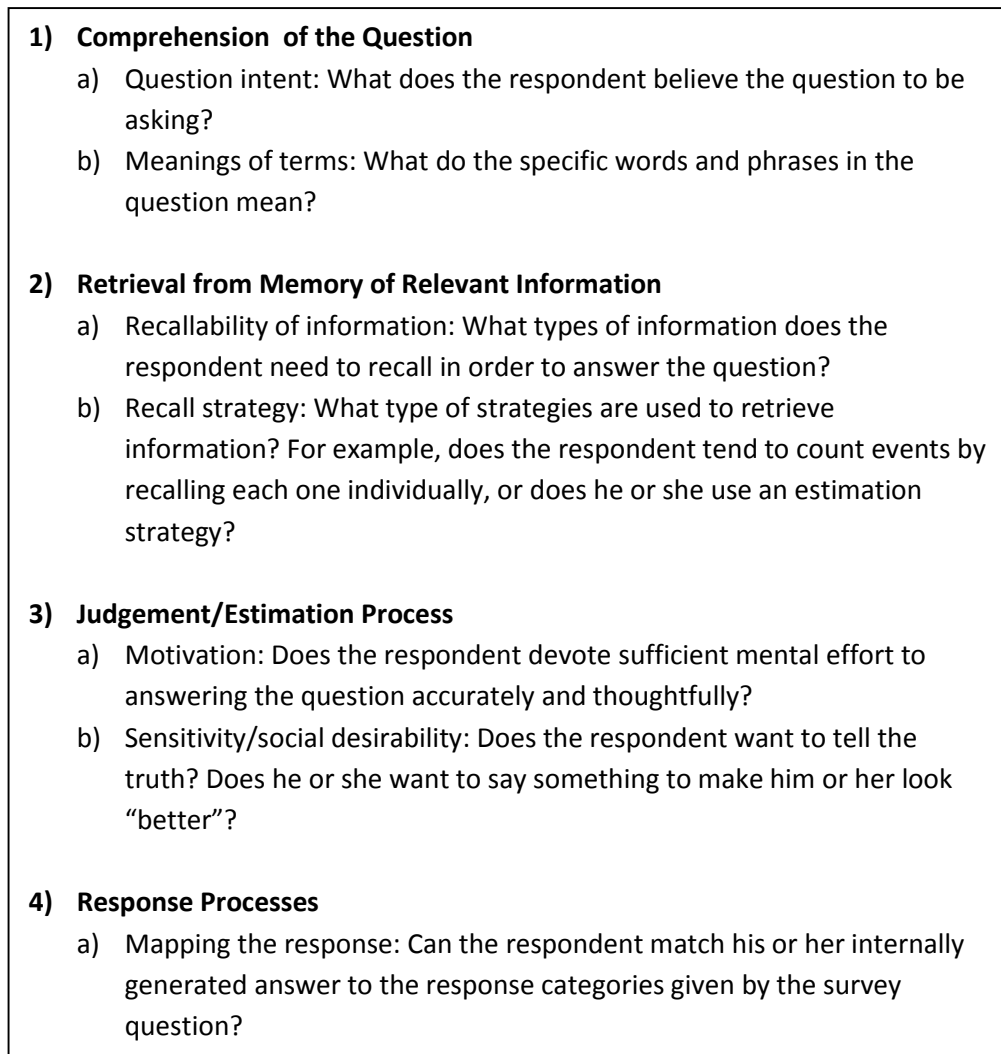
Cognitive Interviewing

Cognitive interviewing is derived from the broader field of Cognitive Aspects of Survey Methodology (CASM). Cognitive Aspects of Survey Methodology as a field emerged in the early 1980s as a result of the interdisciplinary combination of survey methodology and cognitive psychology in the study of survey response error (Jabine et al., 1984). The basic underlying

principle of the CASM is that “responses to survey questions require a series of complex cognitive processes, or information-processing steps, as opposed to a simple stimulus-response sequence in which a question is asked and the respondent produces an answer” (Willis, 2005) (p. 35).

In 1984, Tourangeau (Tourangeau, 1984) proposed a four-stage cognitive model which a respondent goes through when faced with a question; proponents of this model assert that each processing step must be successful if the resulting output is to be free of error. Tourangeau’s model is the most commonly cited cognitive model and is depicted in Figure 35. The idea that an answer to a survey question can be “free of error” carries with it the assumption that the question has a one true distinct meaning which the researcher is trying to accurately communicate to the respondent. Such an assumption cannot be applied to each of the four Natsal questions under study. Although the true meaning underlying the question regarding contraceptive use at first intercourse is relatively explicit, the same cannot be said for the remaining three questions. The concepts of willingness, timing, and autonomy of decision are highly subjective and are likely to have different meanings to different people, based on their own views, priorities and experiences. Nonetheless, the content of the topic guide was informed by Tourangeau’s model and other cognitive interviewing literature.

Figure 35: Tourangeau's (1984) four-stage cognitive model



Prospective narrative approach

The two stage interview approach, which began with a more open-ended narrative discussion about the respondents' first sexual intercourse and followed by the cognitive-style interviewing, was employed for a number of reasons. On discussing the topic guide with a member of my PhD advisory board who has extensive experience in conducting in-depth interviews about sexual behaviour with young people, it was advised that beginning the interview with an account of the first sexual experience would be a more natural way for the participant to get into the right frame of mind and feel comfortable for a conversational interview that would focus on this specific sexual encounter. Other researchers have also employed this technique, reporting that in doing so the "interviewer was able to create a background frame of reference to use throughout the interview. The interviewer could then draw on this information to later probe answers to specific questions" (Cosenza and Fowler, 2000) (p. 995). Similarly, Wilson and Peterson (1999) used a

prospective narrative approach to explore the way in which memory is searched and information reported with regard to past contraceptive use and sexual behaviour and suggested that by asking people to tell their stories in a natural, conversational way, this method also shed light on causal connections within the respondents' accounts.

Conversely, it has been argued that a prospective exploration of the general topic in this way may change the context in which the survey question is asked. In talking about the topic of interest prior to administering the test questions, the respondent is given time to think about the topic area, which they would be unable to do in a real interview situation. This makes it more difficult for the researcher to fully understand how respondents would handle the cognitive task of information retrieval and judgement in the actual interview context (Willis, 2005). However it was decided that for the purpose of this PhD research, it was not so important that the interview context perfectly replicated the original Natsal interview scenario, and rather, great emphasis was placed on ensuring that comfort and rapport had been built with the respondent prior to the arguably more taxing component of the interview, which required a lot of effort on the participants' part in order to provide verbal reasoning behind their answers. On conducting the interviews, having the background frame of reference was particularly useful for ensuring all questions and probes were appropriate.

Verbal probing

Intensive verbal probing is a core verbal reporting technique which is commonly used by cognitive researchers and was relied upon in the interviews to gain an understanding of participants' answers to the Natsal-3 survey questions. This technique involves asking the survey question, and then the interviewer follows up by probing for further specific information relevant to the question asked and/or the answer given. Generally, the interviewer probes further into the basis for the response. Willis (1999) summaries the basic categories of cognitive probes as show in Figure 36 – all of which were used in this study.

Figure 36: Basic categories of cognitive probes and an example of each (Willis, 1999) (p.6)

Probe Category	Example
Comprehension/ Interpretation probe	What does the term "outpatient" mean to you?
Paraphrasing	Can you repeat the question I just asked in your own words?
Confidence judgment	How sure are you that your health insurance covers drug and alcohol treatment?
Recall probe	How do you remember that you went to the doctor five times in the past 12 months?
Specific probe	Why do you think that cancer is the most serious health problem?
General probes	How did you arrive at that answer? Was that easy or hard to answer? I noticed that you hesitated - tell me what you were thinking

Cognitive interviewers often focus outward toward the broader context, as opposed to solely inward toward the question itself. Elaborative probes “focus attention toward to a more complete verbal report , often to determine details about the subject’s life that are relevant to evaluating the survey question” (Willis, 2005) (p. 105). Such elaborative probes aim towards taking a side-track in which the topic of the question is expanded, and the use of which primarily depends on the study objectives. Elaborative probes can be particularly useful when one wants the respondent to elaborate to enable us to examine in wider scope the basis for the individual’s response (Willis, 2005). Beatty et al. (1997) suggest that even the simple “can you tell me more about that?” can be useful in expanding the conversation beyond the strict confines of the question itself. General elaborative probes were relied upon heavily in this study as the focus was more concerned with the wider basis behind the respondents’ answers as opposed to identifying sources of traditional survey ‘error’.

There are two general approaches to probing: concurrent probing and retrospective probing. These refer to the point during the interaction when the probing questions are asked. Concurrent probing involves firstly asking the survey question under study and allowing the respondent to answer, followed by the interviewer asking a probe question and the respondent answering, with further probe questions if necessary, before moving on to the next survey question to be examined. Whereas, retrospective probing involves taking the respondent

through all of the survey questions under study, before asking the probe questions after the entire interview has been undertaken.

Concurrent probing was employed in our interviews as this approach has the advantage that the questions and information to be asked about is still fresh in the respondent's mind during the time of probing. Waiting until after all the survey questions have been asked before beginning to probe may risk that the respondent no longer remembers exactly what they were thinking when they answered a question, and so, instead might fabricate an explanation (Willis, 1999).

The type of probes used can be categorised as scripted (developed before the interview) and spontaneous (asked spontaneously in response to immediate circumstances and discussion raised during the interview with the respondent) probes. Willis (1999) suggests that the most effective interviews consist of a combination of scripted and spontaneous probes; meaning that the main important probes are always asked, but there is also the opportunity to follow-up on issues that emerge naturally during the interview. Although the interviewer had a list of scripted probes in the topic guide, the interviews remained flexible enough so that spontaneous probes could be used when relevant. The order in which specific probes were used changed from interview to interview to ensure that the exchange felt as natural and conversational as possible. Where spontaneous probes emerged that were felt to be of potential wider use, they were added to the topic guide for future interviews.

Ethical concerns

There were two main ethical concerns of relevance to this qualitative study: informed consent and the sensitivity of the interview. Informed consent requires that all participants understand what their participation will involve and that they agree to participate entirely of their own free will. Informed consent was ensured in the following ways:

- At all points of contact, participants were told that participation was entirely voluntary and no pressure was put upon potential respondents to take part.
- Those who agreed to take part were reassured that they could change their mind at any point and could refuse to answer any questions if they felt uncomfortable with them.
- Participants had at least 7 days to consider their decision between receiving the initial recruitment letter, the initial phone call, and the phone call to organise interview. The phone calls provided the opportunity for participants to ask any questions about what the interview would involve.
- All those participating were given a participant information sheet to read and asked to sign a written consent form at the start of each interview.

- The participant information sheet, the consent form, and the introductory chat at the interview all emphasised that the interview was strictly confidential and that any quotes used in the write-up would be anonymised and where necessary, contextual details changed in order to ensure that the participant remained unidentifiable.

With reference to the sensitive nature of the topic, there was the possibility that participants might feel uncomfortable or distressed when talking about their personal and private experiences. However, I felt that those who might be particularly distressed in talking about their first sexual intercourse were unlikely to agree to be interviewed, and that taking part in the original Natsal survey would have provided participants with some experience as to whether they would feel uncomfortable recounting their sexual lives. As a precaution, I carried with me a list of contact details for relevant agencies such as Rape Crisis, Samaritans, and Relate, which could be handed to any respondent who made potentially distressing disclosures.

Respondents were given a £20 high street voucher as a token of thanks for their time and participation. They were also given the option of receiving a summary of the results – to which seven agreed.

Data analysis

Recorded interviews were securely stored on the password-protected LSHTM network. Five interviews were transcribed by me, and the remaining six were transcribed professionally, and were then checked for accuracy and anonymised by me.

Preliminary data analysis began simultaneously while conducting the interviews, which simply involved making notes of observations and any recurrent themes which became apparent during my transcription of the initial interviews.

Formal analysis began after completion and transcription of all eleven interviews, using the National Centre for Social Research's (NatCen) 'framework' technique (Ritchie and Spencer, 1994). 'Framework' is a matrix based analysis method which facilitates rigorous and transparent data management, while maintaining the researchers' contact with the 'raw' data. This approach to data analysis has been recommended for more applied qualitative research, which has clear aims at the outset (Green and Browne, 2005) and specifically, cognitive interviewing data (Willis, 2005). There are five key stages involved in the 'framework' technique:

1. Familiarisation
2. Identifying a thematic framework and developing a coding scheme
3. Indexing

4. Charting
5. Mapping and interpretation

These steps were undertaken as follows:

- 1) Familiarisation with the data was achieved through: conducting all of the interviews, transcribing five interviews myself and checking the professionally transcribed interviews against the recordings, and re-reading the transcripts.
- 2) Once familiar with the data, a coding scheme was developed by reading through the transcripts and noting down words and phrases which could be used as codes, for example, 'relationship with partner', 'feeling ready'. Some codes were also developed based on my original topic guide. Given the structure of the interviews, the content could naturally be split into six components: 1) open account of first sex; 2) willingness (cognitive probing); 3) contraceptive (cognitive probing); 4) timing (cognitive probing); 5) autonomy of decision (cognitive probing); 6) overall coverage and enjoyment. Given the aims of this study within the context of this thesis, the qualitative analysis largely focused on the four sections of the interviews which involved cognitive probing about the Natsal-3 questions. Therefore, the coding frame developed was split into four sections with specific codes developed under the heading of each of the four survey questions. Given the a priori interest in the role of enjoyment in respondents' evaluation of first sex, as well as how young people considered chronological age as an arbiter for transitioning into sexual activity, any mention of these topics was noted.
- 3) Using the coding frame (shown in Appendix 11), all transcripts were coded in Nvivo 10.
- 4) Charting was also conducted in Nvivo 10. Several separate grids were constructed (one for each survey question) with codes across the top and interviewee identifiers down the side. This chart was filled in with summaries of what the interviewee had said relating to a specific code, along with important verbatim quotes, and hyperlinks to the original transcripts, so that access back to the raw data was quick. Rearranging according to the appropriate thematic references in the charts, enabled themes to be compared across and within cases
- 5) The completed grids were very useful in the mapping and interpretation stage, as they summarised a huge amount of information, allowing me to consider the data both within and between cases. The final process mainly involved writing descriptive accounts of emerging themes, drawing diagrams to help me clarify my ideas, and referring back to the raw data when necessary.

Presentation of results

The primary aim of this qualitative study was to explore how respondents went about answering the Natsal-3 questions used to construct the measure of sexual competence, and so this forms the main focus of this chapter. At the beginning of each section, the exact Natsal question is detailed as it was presented to respondents. Presented next are the findings of the qualitative analysis relating to the cognitive interviewing for that survey question, exploring how the respondents went about answering the question, and the wider context and experiences they drew upon in formulating their answer. Illustrative quotes are presented throughout the result section, where sections of the quote have been omitted this is indicated by [...] – all omissions were made for purposes of brevity and do not change the meaning of the extract presented. For this component of the study, only the cognitive interviewing sections of the interview were analysed – i.e. accounts from the open narrative section were not extrapolated by the author to explain the respondents' answers to the Natsal-3 question.

Following this, the findings relating to the respondents' perceived role of enjoyment in the evaluation their first intercourse experience, are discussed as well as their opinion of age as an arbiter for the appropriate onset of sexual activity. These were a subsidiary a priori interest of the researcher.

The final results presented investigate whether the answers given in the in-depth interviews are consistent with the respondents' original Natsal-3 survey responses. Where discrepancies between the two occasions are identified, the respondents' accounts were explored to assess whether any basis for such inconsistencies is apparent from the interview data.

All names provided are pseudonyms, and the participants' current age and age at first sex are also within the parentheses at the end of each illustrative quote. For example, Katie who was 21 when the interview was conducted, and 16 at first sex is presented as (Katie, 21, AFS: 16)

9.1.3 Results

Willingness

Figure 37: Natsal-3 question about willingness at first intercourse

<p>Q: Would you say you were both equally willing to have intercourse that first time, or was one of you more willing than the other?</p> <p>A:</p> <ol style="list-style-type: none">1. Both equally willing2. Respondent more willing3. Partner more willing	<p>Q: If answered: 'partner more willing', then....</p> <p>A:</p> <p>Would you say...</p> <ol style="list-style-type: none">1...that you were also willing,2. or, that you had to be persuaded,3. or, that you were forced?
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Understanding and importance

Respondents generally understood this question to be asking about issues of 'consent', 'pressure', and whether there had been any 'force' or the need for 'persuasion'.

All respondents felt it was important for partners to be equally willing at first sex – though women generally tended to discuss this in terms of the negative feelings that can subsequently result from an encounter in which the partner was more willing:

If I felt pressured into it then I wouldn't be happy in the relationship to carry on (Claire, 21, AFS: 15)

You won't have a good memory[...]if you're not willing to do it with, or not like as willing[...]if you're not like properly into it then it's just going to be a bit like crappy really (Katie, 22, AFS: 16)

Whereas male respondents tended to express the importance of both partners being equally willing at first sex with reference to the idea that anything other than 'equal willingness' could constitute 'rape'.

Yeah, well if the other person don't want it then obviously it's classed as rape isn't it, so you both have to be willing to have sex, otherwise you get arrested for it (Nic, 22, AFS: 16)

Yeah, you've got to be equally willing. You can't go trying to force, that boils down to rape doesn't it if you force yourself onto someone? Or a woman, it's still if they say no and you force yourself then that's rape innit? That's a crime and that's not the road to go down. (Tom, 26, AFS:16)

Owen felt that although consent was important, the necessity of being perfectly *equally* willing was less certain – this seemed to be because he felt that the question might also be tapping into excitement:

They need both to be wanting to do it at the current time, but you can't help it if you're a bit more excited than the other person (Owen, 21, AFS: 14)

The presence or absence of pressure

First and foremost, participants generally explained their given answer to this question with reference to the presence or distinct absence of pressure or persuasion from their partners and/or themselves. Each of the female respondents who reported that their partner had been more willing at first sex talked about how their partners had verbally 'nagged' or 'badgered' them to have sex. This pressure occurred over time – the weeks or months preceding first intercourse - and despite their numerous refusals and telling the partner that they did not feel 'ready', these two participants both expressed that after a while of being worn down, they eventually 'gave in'.

When I could feel that he was trying to go a bit further I would kind of put a halt to it kind of thing and he would be like, "oh why, why don't you just let things happen naturally, why are you stopping it?" and I would explain to him like "because I'm not ready" (Emily, 26, AFS: 14)

Just for the fact that he kept asking me and I was just, you know, oh ok then (Sandra, 24, AFS: 17)

These participants were keen to emphasise that they were not 'forced', fearing that stating their partners were more willing than they were might be interpreted as rape:

He did say it a lot, but I don't want to make out like he forced me to, cause he didn't if you know what I mean....at the time obviously I said yes (Sandra, 24, AFS: 17)

I wouldn't say that I was forced because obviously I have a voice (Emily, 26, AFS: 14)

The follow-up question in Natsal-3 (see Figure 37), presented to these respondents after they had selected 'partner more willing' seemed to make them feel more comfortable with their answer in that they were able to specify that they did not feel 'forced', but that persuasion had occurred.

The distinct lack of perceived pressure from either party was important for those who chose the answer 'equally willing', and was usually the first explanation given as to how they came to choose their answer:

We just both were [equally willing], I wasn't pressuring him and he wasn't pressuring me, so I guess, just kind of know (Claire, 21, AFS: 15)

It never felt like either of us were pushing the other away, it just, it was natural, like it flowed into it (Katie, 22, AFS: 16)

It wasn't a kind of, you know, "I'm going to try and persuade you," or, "You're going to try and persuade me." We both kind of, if it was going to happen it was going to happen. (David, 22, AFS: 16)

Recalling communication of intentions

In describing how they formulated their answers to this question, participants also relied on the recollection of any communication about their own or their partner's intentions. The perceived lack of pressure was often accompanied by some kind of verbal communication through which intentions were shared, but usually in an implicit manner whereby wishes were hinted at but not explicitly expressed. David reported that although he was not really 'bothered either way' about having sex, he knew his girlfriend wanted to when she started dropping what he described as 'hints' relating to the fact that he had recently turned 16, the legal age of consent:

Well, it wasn't brought up in the conversation, but it was kind of mentioned. You know, again, the legal age, you know, she mentioned that I was of the legal age, I can do it, have I thought about it kind of thing. (David, 22, AFS: 16)

Owen's first partner asked him if he was still a virgin and said that they didn't have to rush, which provided him with the indication that she was thinking about having sex with him:

So you kinda knew from that it was going to end up getting there [having sex] (Owen, 21, AFS: 14)

From this exchange, and the lack of any actions on his partner's part to object when they started kissing, he felt it was safe to say mutual willingness could be assumed – though admitted that perfect 'equality' was difficult to establish, stating:

I guess we never sat down and signed a formal agreement (Owen, 21, AFS: 14)

Only two respondents reported a verbal exchange in which intentions about having sex were made entirely explicitly and occurred immediately before the first time having sex – one in the context of a relationship that had been going on for three years:

He asked me and because I said "yes", we were both willing to get to that next stage and have intercourse (Corinne, 26, AFS: 17)

The other was not within a relationship, but happened after a party when both partners were 'drunk':

I was going to sleep on the floor until she said "can you like can you sleep up here" and then when we was laying down it was just, she was talking a little bit about the party and then she said she liked me and then she said she wanted to have sex. (Nic, 22, AFS: 16)

Where there had been no verbal communication, there seems to be a greater reliance on the recollection of the mutuality of physical cues, such as kissing, touching and undressing one another.

It was kind of like getting closer and then like arm around each other and then sort of like having a little, maybe a little bit of foreplay, little bit of play but then it was like kissing....so it was just very open body language, just very like this is going to happen, we're all really cool about it. (Katie, 22, AFS: 16)

It just quite flowed, there was a lot of kissing, there was, we were both touching each other, there was no awkwardness really. There wasn't one person going further than somebody else, it was kind of just very equal really, it was, you know, committed to going for it really and it was, you know, yeah it was just, it just kind of flowed [...] Yeah, sort of undressing each other [...] yeah just equal amounts of undressing each other (Tom, 26, AFS: 16)

What happened after

The events that occurred after first sex also contributed to respondents' answers to this question – though these reflections were usually expressed later on in the interview exchange, and seemed to provide *extra* evidence for the response option chosen, as opposed to being the main determining factor. For those who were equally willing, the fact that their relationship continued and they continued to have sex provided further evidence for mutual willingness.

It wasn't that we had sex and we didn't have it for a long time afterwards, we did have sex whenever we saw each, so yeah, I like I do think that we were both willing to do that (Corinne, 26, AFS: 17)

Well we're both still together and happy and it didn't really didn't really change anything our relationship too much afterwards (Claire, 21, AFS: 15)

The two female respondents who were clear in their answer of 'partner more willing' did not have sex with their partners again after that first time.

For Sandra what happened with her subsequent boyfriend helped her realise that her first experience was not a mutual decision and reinforced that her partner had been more willing and had had to persuade her to have sex:

Just the experience of being with someone else and then knowing if you say no it's ok and it doesn't have to happen imminently they can just wait it out (Sandra, 24, AFS: 17).

Contraceptive use

Figure 38: Natsal-3 question about contraceptive use at first intercourse

Q: Thinking of that first time you had sexual intercourse, did you or your partner use any form of contraception or take any precautions that first time, or not?

A:

1. Condom
2. The pill
3. Emergency contraception
4. Other contraception
5. (Partner) withdrew
6. Made sure it was a safe period
7. No precautions by me, don't know about partner
8. No precautions by either of us

The question about contraceptive use is obviously very different to the other three survey questions because it asks about an observable behaviour that either did or did not happen, whereas the other more psychosocial questions are highly subjective and depend on the respondents' own interpretation of a number of factors.

The respondents did not have much to say about answering this question, they all understood the question and they were all able to remember without difficulty the type of contraception used (all respondents reported using a condom or/and the pill). Those who reported condom use were asked if the condom had been applied prior to any penetration and worn throughout the entirety of the encounter, to assess whether there had been any non-proper use; all respondents reported proper use. The interviews also explored whether any discussion of contraception had occurred between the partners, and whether this had ever been used as an indirect means of communicating ones' intentions about sexual activity. However, generally it seemed that the respondents (or their partners) had acquired condoms well in advance of that first time, 'just in case', as opposed to being part of a plan for engaging in sexual intercourse with that partner.

Timing

Figure 39: Natsal-3 question about timing of first intercourse

Q: Looking back now to the first time you had sexual intercourse, do you think....

A:

1. You should have waited longer before having sex with anyone
2. That you shouldn't have waited so long
3. It was at about the right time

Understanding and importance

When asked to explain in their own words what they thought this question was asking – many of the participants simply rearranged the terms used in the question. Of those who provided alternative language to the original question, two respondents made explicit references to age:

Interviewer: Can you tell me what you think the question is asking? In your own words?

Do you think you were too young or too old? (Claire, 21, AFS: 15)

Looking back do you think you were too young? (Owen, 21, AFS: 14)

Another interpreted it as asking about whether the experience was positive or negative:

Just whether you feel like it was a good experience or a bad experience, cause I think if you say it wasn't right and you should have waited longer its gonna look like you're saying it was a bad experience (Sandra, 21, AFS: 17)

While Katie thought it was tapping into the state of individual:

I think it's asking me to answer whether or not it was, that I was mentally, physically, all of the, prepared that I needed to be, if I had the right state of mind and the right physical, yeah, all of those things. (Katie, 22, AFS: 16)

Respondents found it difficult to answer about the importance of it being the 'right time' to have sex for the first time because there was a general feeling that it was impossible to know if it was the 'right time' until after you've done it:

You don't know when the right time is and then you know when you've had it... it's like anything in life, you know, you never know it's the right time to do anything until you actually do it and then see what you feel like afterwards (Suzy, 20, AFS: 15)

You could think it's the right time and then the person you're having sex with just says "ah no it's just a bit of sex" and that's when they might get hurt from it (Owen, 21, AFS: 14)

You don't know what it's going to be like because you've never done it before, you don't know what you're going to feel like afterwards so, without knowing that, how can you judge whether it is the right time and there's no way you can do it until you've done it. (Sandra, 21, AFS: 17)

Katie discussed how her current opinion that she lost her virginity at the 'right time' may not be stable, and could continue to change in the future according to the nature of her friendship with her first sexual partner:

I don't think you really ever know because in about a year I could think differently, like I could fall out with John [first partner] and then that would be like "oh, I'm so upset that I've lost my virginity to that prick" sort of thing, you know, you just don't know until, it will always be like a changing thing I think. (Katie, 22, AFS: 16)

Being 'ready' or not

When asked to explain how they came to their answer, the initial account tended to relate to whether they felt that they were 'ready' or not.

I think I felt ready mentally and, you know, emotionally I think I felt okay, I didn't feel pressured into doing it, you know, I probably was underage for doing it but, you know, I felt right and, you know, it was the time (Suzy, 20, AFS: 15)

I should have waited longer. Definitely. Um just because I felt so awkward when I had sex that I just don't think I was ready even though a lot of people are at that age I don't think I was. (Sandra, 21, AFS: 17)

The initial mention of being ready or not seemed to imply readiness as an individualistic trait, however, on asking respondents to expand on what being 'ready' actually meant, the nature of the relationship and partner seemed to be an important frame of reference in determining when one was ready.

Interviewer: When you say ready, what is being ready?

Um, I was in the right place with him and felt comfortable, I didn't feel pressured in to it or, I was happy, happy with our relationship, happy with what was going on at the time and just all fitted nicely[...] You just feel it when you're with a person [...]you know that you love them and you're happy and, I think a lot of it you can just tell when you're ready, if you have to think about it too much then you're probably not ready. (Claire, 21, AFS: 15)

Interviewer: How did you feel ready? What was feeling ready for you?

I think more the social aspect. You know, I was in a proper, I was in a serious relationship, it wasn't just a, you know, a kind of, "Let's just fill up time" type thing. It was spending time together, we were getting involved, we were meeting each other's parents, meeting each other's families....it kind of felt right, you know, that it was an actual relationship, so, yeah. (David, 22, AFS: 16)

This was not case for everyone – for Nic, his readiness was not defined by the romantic relationship (he and his first sexual partner were not in a relationship, and had sex after they

had got drunk together at a party), but by the fact that his friends had already had sex:

I decided I was ready because obviously all my mates were doing it, the crowd I was hanging around...obviously they've all done it so that's why I say I was ready (Nic, 22, AFS: 16)

While Tom's notion of readiness was heavily based on his physical maturity and his physiological response to sexual arousal (getting an erection):

Your body kind of tells you really. I think kind of, for a lad you kind of know because you start to get a bit more aroused by things, you do get anyway but I think once you start to hit a certain age you find yourself standing to attention a bit more than normal and you think "oh maybe it's time to kind of go for it". (Tom, 26, AFS:16)

Suzy's account of her 'readiness' also included little reference to the relationship with her boyfriend, and relied more on her personal characteristics, though rather than focusing on physical indicators of readiness, she seem more concerned with mental and emotional aspects of her maturity:

I think feeling mature enough is a good way to put it, you know, within yourself feeling confident enough but also, you know, feeling grown-up enough to do it 'cos it's not exactly a child game is it, so it's [laughs], you know, mm, kind of yeah, make sure that, you know, you're in the right state of mind in the first place to actually take part. (Suzy, 20, AFS: 15)

It should be noted that being in a relationship at first sex was neither necessary nor sufficient for reporting that one felt 'ready' at first sex and that it happened at the 'right time'. There were male and female respondents who were not in a relationship at first sex, but described themselves as 'ready', while there were female respondents who had been in a relationship (in one case lasting for years prior to first intercourse) but described themselves as not 'ready', due to the negative characteristics of the relationship that they had been in.

The nature and length of the romantic relationship

Aside from its implications for determining one's state of 'readiness', the nature and length of the relationship was a recurring topic in participants' discussions of their answer to the timing question. It was felt by some that a longer relationship was important for achieving higher levels of comfort with the partner.

Interviewer: so you said about how long you'd been together, was that important for you?

Um yeah, I guess not so much the number of being together, but just knowing that you've been together long enough that you're happy with each other and felt comfortable

around each other [...] if I wasn't in a relationship I probably wouldn't have had sex for a while after that (Claire, 21, AFS: 15)

Having not been in the relationship long enough made it the 'wrong' time for others:

Interviewer: You said should have waited longer, what do you think would have been the right time for you?

Um when I mean longer, I mean with the person longer, not my age, just being in a relationship with them longer, so that I was more comfortable in the relationship [...] you've known each other longer and you're just more comfortable with that person, just waiting a little bit longer, time wise, not age wise, but length of time you're with them wise. (Sandra, 24, AFS: 17)

What happened after

What happened after the first intercourse also contributed to the way in which participants answered the timing question – though rather than being the main determining factor, the events or feelings after the first time were reported in terms of additional confirmation of their answer, alongside their references to readiness and the state of the relationship.

For Sandra, the relationship that followed the one in which her first sexual intercourse took place provided such a contrasting set of experiences that it further confirmed that her first intercourse did not occur at the 'right time'. With her next boyfriend, they waited longer and engaged in other sexual practices before having intercourse, and she felt that had constituted a better scenario:

....then I felt more comfortable with him [next boyfriend], cause we sort of knew how each other sort of worked and what was there and things like that instead of just being a bit sort of, ah that's a bit awkward. It's just a bit easier (Sandra, 24, AFS: 17)

For Emily, her partner's behaviour after they had had sex was a clear indication that it had not been the 'right time':

He just wanted something, it wasn't genuine....his attitude was already, it was already disgusting before but it was like once he had got it, it was just like, "yeah, like I don't really care kind of thing now, like obviously if I get it again it's a bonus innit but I've already got it innit", so I think it was like a point to prove, like he was trying to prove something (Emily, 26, AFS: 14)

Among some of the respondents who reported their first sex happened at 'about the right time', their lack of feelings of regret provided evidence to back up their response:

I don't know, I didn't feel any regret after doing it, quite, you know, and I think it felt right. (Suzy, 20, AFS: 15)

If you don't regret it, yeah if you don't think kinda "oh no" uh - I guess you don't know the right time to the specific date or whatever but you know within your own personal self (Owen, 21, AFS: 14)

However, feeling regret was not a defining feature of those who stated that they wished they had waited longer:

I don't regret it, I just wish I'd been a bit more mature, like I am, not then, but at the time you're always like ah no it's the right thing for me and no one will tell you otherwise. (Sandra, 24, AFS: 17)

I don't regret it but things would have worked out differently if I didn't, so I don't regret it, yeah. (Nic, 22, AFS: 16)

Better than an alternative scenario

In deciding that their first intercourse happened at the 'right time' respondents also drew on an 'at least it wasn't' type narrative, whereby their experience was deemed better than a hypothetical scenario which might have occurred if they had waited longer before having sex for the first time.

Because it was with the right person, well a good person, it wasn't just with some random drunken anything [...] I think if I'd have waited it probably would have ended up being one of those guys in an alley, really drunk off my face, don't remember, not so willing sort of crappy experiences (Katie, 22, AFS: 16)

If it didn't happen then then you don't know do you, it could've ended up being a WKD [alcoholic drink] night down the park...it was sort of the way I'd have done it if I'd had more of an ideal [...] I knew the person and that for me was fairly right about it (Owen, 21, AFS:14)

Age

Only one participant explicitly referred to age at first sex being a consideration in deciding on his answer to this question. Owen initially felt that he might have given the 'wish I'd waited longer' answer because he felt that at 14 he was too young to be having sex. However, on further reflection, he felt that actually it was the 'right time' for *him*. He explained this initial preoccupation with his young age with reference to his younger siblings aged 13/14, and that the idea of his brothers having sex at that age made him feel uncomfortable:

I've been saying I was too young – for me it was the right time [at 14], but then the reason I thought it was too young is cause I'm basing it on looking at other people thinking I wouldn't want them [younger siblings to be having sex]. (Owen, 21, AFS: 14)

Although others made references to the age of consent, participants did not generally frame their idea of timing in terms of age, but did draw upon the concept of maturity:

Well legally you're supposed to be 16 aren't you, but well, [laughs] it's just a number, you got to be like mature enough about it (Claire, 21, AFS: 15)

[I was] mature enough in the sense that like I knew that you had to use a condom or that you had to be on the pill or both, and the fact that obviously you can get pregnant and that, but not mature enough to think well is the right person for me...and if it is the right time, if that makes sense. (Sandra, 24, AFS: 17)

What applied at the time

Figure 40: Natsal-3 question asking about what applied at the time of first intercourse

<p>Q: Which one of these applied to you at the time.... (choose the main one that applied at the time)</p> <p>A:</p> <ol style="list-style-type: none">1. I was curious about what it would be like2. I was carried away by my feelings3. Most people in my age group seemed to be doing it4. It seemed like a natural 'follow on' in the relationship5. I was a bit drunk at the time6. I had smoked some cannabis7. I had take some other drugs8. I wanted to lose my virginity9. I was in love10. Can't choose/more than one main factor
--

The Natsal-3 question presented in Figure 40 is used to derive the 'autonomy of decision' component of the sexual competence measure, essentially treating the answer given as a 'reason' for first sex, even though this language is not used in the original question.

However, respondents did seem to interpret this question to be asking about the 'reason why' they had sex:

I think they're trying to ask is that the reason that you went and had sex (Owen, 21, AFS: 14)

I think it's asking, just to find out why it happened I guess, why you chose that point because yeah, or if you were influenced by anything other than just wanting to do it (Katie, 22, AFS: 16)

What was the main reason why I done my actions what I done, that was the main thing to contribute behind it, the reasons why it actually happened, yeah (Emily, 26, AFS: 14)

'Natural follow-on in the relationship'

Four participants chose this as the main 'reason' that applied at the time and in giving this answer, they talked not only about the length or seriousness of the relationship, but also that they had already engaged in non-coital sexual practices with their partner and sexual intercourse came next in the normative sequencing of sexual activities.

We'd just been together for a while and we both loved each other and we'd done everything else and we just could tell between us that it was the natural way for us to carry on together....It's a thing like the American first base second base, third base. I guess you kinda follow on like that. (Claire, 21, AFS: 15)

You done your kissing and your oral sex and it just seemed like well that's the next thing to do [...] sort of goes kissing, then sort of sex ends up being like the last, it was for me any way (Owen, 21, AFS: 14)

We had done the foreplay, and it was the next stage in the relationship, the next flow on of what was happening for us (Corinne, 26, AFS: 17)

Having been in a romantic relationship wasn't a necessary criterion for giving this answer, Katie was 'just friends' with her first partner, but she still felt that the natural follow-on answer best suited her situation:

I think blatantly it's that it seemed like a natural follow-on [...] we were spending lots of time together and being really close and all that stuff, it just felt like it was right really for everyone, was a good idea (Katie, 22, AFS: 15)

'Most people my age group seemed to be doing it'

Emily and Sandra both gave this answer, but their accounts as to why were quite different to one another. Sandra was aware that her best friends had had sex and felt she wasn't able to partake in their many conversations about it, but did not experience any overt pressure from them to have sex. Emily's friends, however, encouraged and even hassled her to have sex with her boyfriend.

They would say things like "oh, but it's not like as if you've just met him and you lot was together for however how long before and he really loves you" [...] you know, like just trying to egg it on, like "it's nothing big", like "it's okay", like "you lot love each other, we've done it, don't be scared, there's nothing to be scared of", you know, "you become a woman" and you know like all them type of things (Emily, 26, AFS: 14)

More than one reason

Many participants found it difficult to just select the one main reason that applied to them – particular answer categories seemed to pair together. Some respondents felt both: 'most people my age group doing it' and 'curious about what it would be like' applied to them:

I knew when I had sex that I had it mostly because most of the people were and I just wanted to, it was like most of the people were and I was curious why they were all doing it, so I wanted to do it, so the two sort of go hand in hand with each other. (Sandra, 24, AFS: 17)

Obviously as my mates were talking about it all the time I was just really curious (Nic, 22, AFS: 16)

Being 'in love' and 'natural follow-on' in the relationship also paired together for two respondents:

It's soppy – I was in love or it seemed like a natural follow on in the relationship – both of those [...] I think they're kind of similar, it wouldn't be a natural follow on if you didn't love them I don't think (Claire, 21, AFS: 15)

Positive or negative reasons to have first sex

After discussing their own answer, participants were taken through the list of answer categories for this question, and asked to say whether they thought each was a 'negative' or 'positive' reason for having sex for the first time and to explain their reasoning. Few of the answer categories were interpreted as consistently positive or negative between the eleven participants. Generally, the categories 'natural follow-on within the relationship' and 'in love' were consistently interpreted as 'good' or 'positive' reasons for engaging in sex, while the 'most people in my age group seemed to be doing it' answer was felt by all respondents to be a bad reason for having sex, generally drawing on the negative aspects of 'peer pressure' and having sex 'just because everyone else was'.

The answers relating to the use of alcohol, cannabis, and other drugs were generally seen as bad reasons to have sex for the first time due to the negative influence they can have on decision-making and the regret that can result. However, some respondents also noted the role that alcohol and/or cannabis might play in helping young people to relax before losing their virginity. As long as the wider circumstances of the sexual encounter were deemed acceptable, it was felt that the additional use of alcohol or drugs would not cause this to be classified as an inherently negative experience.

Depends on your personal situation, so it's not a very good reason if you're a bit drunk at the time and you didn't know who they were but if you were with your boyfriend, you both got a bit drunk at the time that's not a bad reason. So it's all like personal situation, circumstance really. (Katie, 22, AFS: 16)

Interviewer: So would you say cannabis is, would you say that was a positive or negative?

I wouldn't say it's either [...] I had a friend that really really wanted [to have sex], so nervous and so body conscious, you know, her boyfriend loved her to pieces and they're still together now and she was so nervous that she did smoke a bit of cannabis before and I speak to her now about it and she's like, "I don't regret doing it because at the end of it calmed me down a little bit to get my nerves over and stop thinking about my body and think about how much I liked my boyfriend"... (Suzy, 20, AFS: 15)

The interpretation of the remaining answer categories: 'curiosity', 'carried away by my feelings' and 'wanted to lose virginity' varied in the way they were considered. Some felt them to be negative due to the lack of apparent emotional attachment embedded in them, while others considered them to be 'middle of the road answers', and whether they were good or not

depended more on the presence or absence of other factors that were considered more important in defining the nature of the encounter. Below are extracts from the discussions about the nature of these three answer categories.

“I was curious about what it would be like”:

Cause you shouldn't just be curious, if you're just curious you're not having any sort of emotional attachment to it, so you're just sort of doing it for the sake of doing it, you could hurt someone in the process – it would be weird to think someone would want to do it just because they were curious (Owen, 21, AFS: 14)

I think that's a sort of, it's not a good reason but it's not a bad reason, it's just a thing isn't it? You, everyone's curious about everything, you want to try everything once at least so I don't think it's a bad thing, a bad reason to do it so long as it is in a good place, as long as you're in a good place.

Interviewer: Right. In terms of a good place with...?

Yeah, your head and with the right person and, you know, it's, you can be curious about it as long as you do it safely and like consciously, yeah, not be a twat like. (Katie, 22, AFS: 16)

“I was carried away by my feelings”:

If that was the sense of both people were like just carried away you know, they're not in a relationship but they're both sort of willing again, cause you could get carried away by your feelings but then that could turn you blind to what other people might want, so good if it's the sense of you just sort of quite carried away, like yeah I really like you...but bad if it was just picked some randomer because you felt like it (Owen, 21, AFS:14)

So that, that can be a negative, because feelings can be very misleading. You can think you're feeling one thing, but actually you're feeling something completely different. (David, 22, AFS: 16)

“I wanted to lose my virginity”:

That's a tricky one. I suppose it could be a positive and a negative, depending on the individual and their mindset. I mean, they might want to lose their virginity because they feel as though they're being forced into it because everybody else is doing it. But then again, you know, you might be at the legal age, you might be in a serious relationship, and you might have a great family surrounding you so you feel great within yourself, so you think to yourself, “Yeah, I'm ready to cross that milestone.” So, yeah, that could be a bit of both. (David, 22, AFS: 16)

The roles of enjoyment and age

Enjoyment

Towards the end of the interview, participants were asked to consider the four cards showing the Natsal-3 survey questions, and were asked if they felt there was anything else that was important to the way they felt about and evaluated their first experience of sexual intercourse. Participants felt the four cards relating to willingness, contraceptive use, timing, and what applied at the time, pretty much 'covered it'. Of interest was that no respondent volunteered the physical experience or enjoyment derived from the encounter as an aspect of the experience of first sex that was 'missing'.

Respondents were asked to put the four cards in order of their importance for the way in which they feel about their first intercourse. The interviewer then asked specifically about the importance of the physical experience and enjoyment and where a hypothetical card on 'enjoyment' might fit in their specified order. Both men and women placed 'enjoyment' towards the bottom or at the bottom in the ordering of the cards. However, respondents tended to make distinctions between the importance of enjoyment at first intercourse and the importance of enjoyment for their sexual life more generally. It was felt that first intercourse was probably not going to be the best physical experience, but this did not define the way people subsequently felt about the encounter, whereas for general sex life, enjoyment was an expectation and ranked far higher in how they would evaluate their experiences.

Interviewer: So if there was a question there that asked did you enjoy it or how much did you enjoy it, where would that be ordered in that pile?

Erm, possibly the bottom because I know it doesn't stay that way

Interviewer: What do you mean by that?

Like I have sex more often now and I enjoy it, I know it's not boring for everyone and you're not you don't feel awkward all the time and it doesn't hurt all the time so I know that it gets better it's not just awkward and boring and painful, so to me now, that doesn't matter about that, it doesn't matter at all, so that's why it would be at the bottom cause it doesn't matter.

Interviewer: And so, if these questions were more about your general sex life, where would enjoyment be in that pile?

Probably on the top (Sandra, 24, AFS: 17)

Some of the young men discussed how for that first time having sex, it was more about 'just doing it', rather than thinking about the physical pleasure that would result.

Because obviously the first time it was just I want to experience it, I want to get it done and finished with. (Nic, 22, AFS: 16)

I don't think I set off on my journey to her house think ah yeah I can't wait, I hope this is brilliant, really enjoyable sort of thing, it wasn't so much for that the first time, it wasn't so much for the physical pleasure of it for me

Interviewer: What was it about?

I dunno, just doing it, cause you know everything built up around it – ah this is the time, got a good day, so yeah that would be why for the first time that would still go last yeah [enjoyment the least important card] (Owen, 21, AFS: 14)

Katie talked about her first sexual intercourse in a very positive way throughout the interview, and though she did not find it particularly physically enjoyable, stating that she expected it was going to be the 'worst sex' she'd ever have, this lack of physical pleasure did not taint her feelings about the experience. David was also very positive in his account of his first sex, despite feeling that he didn't really enjoy it in the traditional physical sense:

You don't really get time to enjoy it, I suppose. I mean, it's kind of one of those things, you know. It's more concern for the other, for your partner and if they're enjoying it, and kind of you've just got all these different kind of emotions, feelings and thoughts going on at once. You don't really feel much enjoyment. (David, 22, AFS: 16)

Age

Age came up in most of the interviews and when it did, respondents were asked whether they thought there was a 'good' or 'ideal' age at which to start having sex. None of the respondents felt that there was a 'good' age as it is 'just a number', tending to talk about how it was more to do with the individual and context as opposed to how old they were.

I don't think there's a good age, but, because everyone develops at a different stage and that's mentally and physically, and, but a good time, um, I would say you need to be in a feel like you're in a long-term relationship and you need to know that you're both committed to each other (Corinne, 26, AFS: 17)

No. There's no ideal age. It's just you, and when you feel as though you're ready. (David, 22, AFS: 16)

Obviously because some people are more mature than others, especially girls, girls are more mature than boys so if you find somebody that you've connected with because I know people.... that have lost their virginity at like fifteen and they're still with the person now so it's, do you understand, it's different strokes for different folks innit (Emily, 26, AFS: 14)

However, there were respondents that felt although there wasn't a 'good' age, there was a 'too young'.

No – it's person-specific – yeah it's all dependent on the person, obviously it needs to be – I wouldn't have thought even at anything below 14 – ah I don't know, you don't know

what people are like [...] I wouldn't say there's a right age but I also think there's a too young age if you see what I mean (Owen, 21, AFS: 14)

Where people talked about a 'too young' age, this was often with reference to hearing stories about 11 and 12 year olds having sex in the media⁴ and also, imagining their young family members having sex. For example, Owen specifically mentioned his discomfort with the idea of his 13/14 year old brothers having sex, while Nic and Tom had sons/daughters who they did not want to become sexually active at a young age.

Of note, is how some of the respondents recalled passing the legal age of consent as an indicator of being 'old enough'. Sandra talked about how being past the age of consent contributed to her feeling that she should 'just get it done'.

I still wasn't sure, it was very sort of uh I don't know, and I just thought, I'm old enough I should just get a move on and just do it.

Interviewer: When you say old enough what you mean?

Like I was seventeen, I was past the age, and you know a lot of people do it a lot younger and so I just thought I need to just do it and just get it done and over with.

Interviewer: When you say past the age you mean?

16, yeah. (Sandra, 24, AFS: 17)

Similarly, David's girlfriend used the fact that he had turned 16 as the basis for her hints that she wanted to have sex:

Oh, it was just more of, "You're 16 now," you know, "you're legal" it was more that kind of thing, and it was, she was asking, you know, "Have you ever thought about it?" you know, stuff like that (David, 22, AFS: 16)

⁴ There was recently a story in the media that got a lot of attention about a girl and boy who became parents at 12 and 13 years old, respectively – this was often drawn upon in respondents' accounts as to what was 'too young' - <http://www.dailymail.co.uk/news/article-2605672/Britains-youngest-parents-Mother-12-gives-birth-7lb-baby-girl-falling-pregnant-primary-school-boy-aged-13.html>

Do the answers given by respondents in the interview match their original Natsal-3 answers?

Table 46 presents each participant's responses to the four questions in the original Natsal-3 interview and the responses given during the follow-up interview. The majority respondents provided answers that were consistent with their original Natsal-3 response. Among the respondents who were classified as 'sexually competent' at first sex in Natsal-3, all five gave consistently positive answers to the four questions under study. More inconsistencies were observed among those classified as not sexually competent. Where inconsistencies were observed, the relevant transcripts were examined to assess whether a basis for the disparities could be identified from the interviewees' accounts. Where two values are presented, e.g. '0/1', this indicates that the respondent had fluctuated between answering positively and negatively to that question at some point within the follow-up interview.

Table 46: Participants answers in Natsal-3 survey and answers in follow-up interview (discordant answers highlighted)

Pseudonym		Equal willingness	Autonomous reason	Right time	Contraception
Claire	Natsal response	1	1	1	1
	Interview response	1	1	1	1
Suzy	Natsal response	1	1	1	1
	Interview response	1	1	1	1
Katie	Natsal response	1	1	1	1
	Interview response	1	1	1	1
Tom	Natsal response	1	1	1	1
	Interview response	1	1	1	1
David	Natsal response	1	1	1	1
	Interview response	1	1	1	1
Sandra	Natsal response	1	1	0	0 or 1
	Interview response	0	0/1	0	1
Emily	Natsal response	0	0	0	0 or 1
	Interview response	0	0	0	1
Corinne	Natsal response	0	1	1	0 or 1
	Interview response	1	1	0/1	1
Ben	Natsal response	1	1	0	0 or 1
	Interview response	1	1	1	1
Owen	Natsal response	1	1	0	0 or 1
	Interview response	1	1	1/0	1
Nic	Natsal response	0	1	0	0 or 1
	Interview response	1/0	1	0	1

Sandra

In the Natsal-3 interview, Sandra reported that both partners were equally willing at first sex, though in the follow-up interview she stated that she felt her partner had been more willing as he had 'nagged' and 'badgered' her about having sex until she 'gave in'. From her account, there

are some clues as to why she might have selected the 'equally willing' answer in Natsal. When asked what answer she might have given the day after she had sex for the first time, she felt she might have said 'equally willing' because she had said 'yes' to having sex:

I don't know, because at the time obviously I said yes so we were both equally willing, but he was still, he was the one who brought it up, so I don't know, that's the only thing, [...] he did say it a lot, but I don't want to like make out that he forced me to, cause he didn't if you know what I mean. So I probably of then said both equally willing but I just, now I look back I'm like he really shouldn't have badgered me that much. (Sandra, 24, AFS: 17)

It seems that Sandra feels some discomfort in choosing the 'partner more willing' category due to the connotations of rape that might be perceived to accompany it. That she said 'yes' to having sex seems to make her consider that they were 'equally willing', despite the obvious pressure that came from her partner. When shown the follow-up question, which would have been presented in Natsal after respondents selected the 'partner more willing' category, Sandra seemed more comfortable in giving her answer as she was able to back it up specifying that she was not 'forced', but 'persuaded':

Q: *If answered: partner more willing, then....*

A: *Would you say...*

- 1 *...that you were also willing,*
- 2 *or, that you had to be persuaded,*
- 3 *or, that you were forced?*

Interviewer: What do think about those answer categories?

They're much better because they're sort of what I was saying to go with that, as a follow up question it is sort of easier to then describe what you're saying.

Interviewer: Giving the answer 'partner more willing', what do you think people might understand by that?

That you were sort of forced into it and not, not that they were persuading you or that you were willing too just not as much as them, which I think is a better way because then it doesn't look like people have just been forced into having sex. (Sandra, 24, AFS: 17)

This may flag up an issue with the way these questions are presented in the Natsal survey. Participants are only routed to this follow-on question if they gave the answer 'partner more willing'. But if this answer category is understood to imply a more extreme type of non-consensual experience, the true prevalence of unequal willingness may have been underestimated.

Sandra also showed some inconsistency in her answers to the 'autonomous reason' component. In the follow-up interview she felt that two answers applied to her – 'I was curious' and 'most

people in my age group seemed to be doing it', which may explain the discrepancy in answers between the follow-up interview and the original Natsal-3 interview:

When I had sex that I had it mostly because most of the people were and I just wanted to, it was like most of the people were and I was curious why they were all doing it, so I wanted to do it, so the two sort of go hand in hand with each other (Sandra, 24, AFS: 17)

Corinne

Corinne had reported unequal willingness at first sex in the original Natsal-3 interview, though in the follow-up interview she reported equal willingness because 'he [partner] had asked me and because I had said yes'. However, when asked about what answer she thought she might have given the day after she first had sex, it became apparent why she might have felt that her partner was more willing:

Interviewer: And so if I'd asked you this question the day after you'd had sex for the first time?

Think it would be different

Interviewer: Yeah? What would it be?

Partner more willing. Um trying to think back, um, cause just body language and because it seemed like we were rushing it because his parents were coming back [...] just the way he was that he was on top of me and um and when he asked me [to have sex] there was this "do you want to" there was this "please" in the air, like "please say yes please say yes", cause he was ready [talking about erection] (Corinne, 26, AFS: 17)

Despite reporting that her first sex had happened 'at about the right time' in Natsal-3, in the follow-up interview Corinne found it difficult to choose between the 'right time' and 'should have waited longer' answer options. This was because although she felt it was the 'right time' in that her first sex had happened with the context of a steady and long-term relationship, she also felt that the particular situation, whereby the encounter was 'rushed' due to their fear that her partner's parents would return home, was less than ideal and may have been better if they had waited for a different scenario.

So it was about the right time in our relationship [...] because we were dating for three years and just things were leading to that stage, um, I should've waited longer before – um, we could've waited longer and it wouldn't have been so rushed (Corinne, 26, AFS: 17)

This illustrates how even with a single respondent, distinct conceptualisations of 'timing' exist, and may not always be compatible with a single response option.

Owen

Owen also drew upon different notions of timing which might explain the discrepancy between his original Natsal-3 response and his follow-up interview answers. He felt that he would have

selected the 'should have waited longer' response in the original survey, due to his age at time of first sex (14 years) and because he didn't like the idea of his 14 year old brother having sex, however, on reflection he felt that the time was right for *him* as he was 'more than happy' to have sex and if he had waited longer, he might have lost his virginity in a less than ideal scenario such as a 'WKD [alcoholic beverage] night at the park'.

All previous I've been saying I was too young, for me it was the right time, but then the reason I thought it was too young is cause I'm basing it on looking at other people thinking I wouldn't want them [to be having sex], but then they will make that decision because for them they'll know if it's the right or wrong time, they'll know in themselves. (Owen, 21, AFS: 14)

Nic

Nic had a discrepancy in his answer to the question about willingness between Natsal-3 and the follow-up interview. During the follow-up interview he initially answered 'both equally willing', but after talking about how he came to this answer he then decided that perhaps his partner had been more willing than him, as she 'came on' to him – this alternating between these answers may also explain the inconsistency between the two interviews.

We were both drunk and we both wanted the same thing, I liked her, she liked me and cause obviously we both wanted to have sex with each other that night so that's why said both willing [...] Well, come to think of it now, I think she was more equal than me cause she came on to me [...] she wanted it yeah she basically, she come on to me so she was more willing to have sex with me than I was (Nic, 22, AFS: 16)

Ben

No explanation for the discrepancy in Ben's responses could be drawn from the content of the interview. He was sure about his answer of 'right time' and this was largely based on the fact that he definitely didn't feel he needed to have waited longer and that he could not see a reason why he would have felt he wanted to do it earlier.

9.1.4 Discussion

Overall, this qualitative investigation suggests that the way in which young people consider and evaluate their experience of first sex intercourse is located within a bio-psychosocial theoretical framework, whereby respondents draw upon a complex and diverse array of personal characteristics and circumstances and social influences to formulate their answers to questions about their first intercourse. This finding is consistent with Skinner et al. (2008) qualitative study exploring young Australian girls' experiences and perception of first intercourse, in which respondents' reflections on first sex were discussed with reference to characteristics of the self, the partner and the wider social context.

The survey questions under focus do not simply tap into a static reality of how first sexual intercourse occurred, but are answered within a wider narrative concerned with the state of the self, the relationship with the partner, and the feelings and events that followed that first intercourse. For traditional survey questions seeking to tap into an observable reality, the results of these cognitive interviews might create concern, given the varying interpretations of the questions and the huge range of factors drawn upon in informing respondents' answers. But the interpretive nature of the questions may actually be an advantage in that they allow young people to base their answers on what was important in defining the experience for *them*.

Generally, the understanding and the interpretation of the question about relative willingness of partners at first sex was similar among respondents, and their responses to this question relied on their recollection of verbal and physical cues that indicated their partner wished to have sex. The main factor in deciding on an answer to this question was the presence or distinct absence of pressure from either the respondent or partner. Few respondents reported explicit verbal communication prior to having sex; often they relied on verbal yet ambiguous messages about their wishes or the interaction took place without verbal communication but with physical behaviours indicating one another's wishes. This reliance on vague verbal or physical cues is very much in accordance with findings of previous qualitative research carried out with young people in England (Mitchell and Wellings, 1998). It has been suggested that ambiguity in sexual encounters can be a useful function in protecting the self and others from rejection and avoiding false assumptions (Mitchell and Wellings, 2002). Although such ambiguity may impede partners' ability to determine *equal* willingness, it seems that explicit verbal communication was common to the respondents who reported *unequal* willingness. Their partners had verbally 'nagged' and 'badgered' them into having sex, despite their repeated refusals. The finding that some respondents interpreted connotations of rape or force from the 'partner more willing' answer option may mean that the true proportion whose partner was more willing at first sex is underestimated in the Natsal-3 survey. The female respondents who gave this answer were very

keen to stress that they were not 'forced' and seemed more comfortable in their given answer when they were able to specify that they been 'persuaded' in the follow-up question – which in the Natsal-3 interview was not asked of all informants but would have only be presented if they had selected the 'partner more willing' response option.

The way in which answers to the timing question were formulated was complex, and departed from conventional notions of timing. Although age was occasionally mentioned when respondents were asked to repeat the question in their own words, it seemed to rarely feature as a consideration in forming their own response. The only classic temporal consideration was length of relationship prior to first sex; the others were concerned with aspects of the self, the partner, the relationship, the scenario, and the feelings experienced afterwards.

While the respondents drew upon specific interactions and behaviours in answering the willingness question, the timing question was generally answered with reference to more abstract concepts such as 'readiness' and the feelings that followed the sexual encounter. Although a wide range of aspects were drawn upon, the initial and seemingly most salient thoughts seem to relate to the notion of personal 'readiness', with reference to both its presence and absence. 'Readiness' was rarely a state dependent only on the individual, but was often defined with reference to the relationship with the partner. However, first sex having occurred within the context of a relationship was neither necessary nor sufficient for being 'ready' and reporting that first intercourse occurred at the 'right time'. While a relationship may provide the prior experience and comfort that was important for some respondents, the status of 'being in a relationship' also appeared for others to provide the opportunity for, and legitimisation of, continuing pressure from the partner to have sex.

The majority of the participants thought that there was great difficulty in knowing when the 'right time' to have sex was until after the act has been done. Hence, there is no guarantee that if those respondents who wished they had waited longer to have sex had done so, that they would then have had a more positive experience and chosen the 'right time' to have sex. The reported difficulties in knowing in advance whether it is the 'right time' to have sex or not, has implications for educational and interventional efforts aiming to equip young people for their transition into sexual activity, in that it may be an unrealistic goal to try and enable young people to identify what constitutes the 'right time'. Participants seemed to have very coherent ideas about what a more negative alternative scenario might consist of, and the fact that their first time differed from such a scenario helped them decide that their first intercourse had occurred at the 'right time'. Perhaps these well-defined ideas about what would constitute a negative context for first sex could be capitalised upon in sex education, whereby young people are

encouraged to consider and recognise the less-than-ideal circumstances for sexual encounters which may increase the likelihood of subsequently feeling that first intercourse did not happen at the 'right time'.

Participants understood the 'what applied at the time' question to be asking about the 'reason why' they had sex when they did. Unsurprisingly, respondents found it difficult to choose just one answer, and identified certain response options that naturally paired together. Of particular note with this question was how respondents interpreted the response options as negative or positive reasons to have sex for the first time. The Natsal-3 coding categorises the options as indicative of 'autonomous' or 'non-autonomous' decision-making. While curiosity, being carried away by one's feelings, and wanting to lose virginity, will have been coded as an autonomous reason in the sexual competence measure, the respondents did not necessarily perceive these to be good reasons to have sex, often due to the perceived lack of feeling or emotional closeness embedded in these answers. Furthermore, Natsal-3 coding classified the answer categories, 'a bit drunk' and 'smoked some cannabis' as indicative of non-autonomous decision-making, however, some respondents felt that these conditions were not inherently negative, and in the right context may be positive and rational strategies for dealing with nerves and anxiety. Many discussed being within a relationship as a contextual factor that could make some of the more 'negative' reasons for first sex more acceptable. These 'ifs and buts' that arose highlight a weakness in quantitative research that has been noted by others, whereby the complexities within sexual behaviour are obscured in answers to simple survey questions (Mitchell and Wellings, 2002; Ingham, 1994).

The enjoyment and pleasure derived from the sexual encounter is conspicuously absent from the measure of sexual competence, despite it featuring in several definitions of sexual health (Edwards and Coleman, 2004), and therefore, this has been considered a threat to the content validity of the measure. However, in general, enjoyment did not seem to be an important consideration for the way in which respondents evaluated and thought back to their first sexual intercourse. Until the respondents were specifically questioned about the physical experience and enjoyment, no mentions of pleasure were volunteered in the wider interviews. When the interviewer brought up the question of enjoyment, specifically in terms of the first experience of sexual intercourse, the respondents did not place much or any emphasis on the importance of physical pleasure in defining that first time. There were respondents who were classified as 'sexually competent' and gave very positive accounts of their first sex, who did not find the experience particularly physically pleasurable (and sometimes reported pain) – but this did not taint their overall evaluation of the experience. The majority of participants spontaneously made distinctions in terms of importance of enjoyment at *first sex* and at *subsequent* sexual

encounters in their sex life more generally, whereby enjoyment may not be a realistic, expected or achievable goal for the first time one has sex and therefore does not define the encounter, whereas in general sex life there is an expectation of and greater emphasis on physical enjoyment. Even among the male respondents, for whom first sex is likely to be more physiologically satisfying (Sprecher et al., 1995; Higgins et al., 2010), there seemed to be little emphasis on physical pleasure, feeling that their greater concern was just the fact of 'getting it done'. Holland et al. (2000) also notes that for young men, "the main point is to do it" (p. 223) and relates this to first sexual intercourse being an experience through which 'manhood' is tangibly achieved. Whereas when young women come to experience their first intercourse, they are already constituted as a 'woman' due to their experience of puberty and particularly, the onset of menstruation.

The way in which participants discussed the importance, or rather, the irrelevance of age in the consideration of their first time having intercourse was compatible with the basis of a measure concerned with contextual attributes of the encounter such as sexual competence. It was generally felt that age was 'just a number', and there was no ideal age at which to have sex for the first time, rather it was more to do with the particular individual - as people mature at different rates, and the context – such as being within a relationship or not being under undue pressure.

The age of consent did occasionally come up in interviewees' narratives – but it did not seem to act as a deterrent against having sex at a younger age. Of note, is how one respondent interpreted that her being over the legal age of consent made her 'old enough', but when she did have sex for the first time, she did not feel 'ready'. It seemed that enshrinement of age 16 in law had added a level of implicit pressure, in that even the law has determined that over 16s are 'old enough'. This mirrors a finding in Thomson's (2004) qualitative study of UK 11-16 year olds in which some respondents felt that the legal age of consent could be drawn upon as a 'safety net' when under pressure to have sex. If the law can be used by persons younger than 16 as a reason to refuse unwanted sex, then it seems reasonable that this perceived protection is lost when one has reached the legal age of consent.

Limitations

The small number of people interviewed in this study is typical of cognitive interviewing, as rather than being concerned with generalisability, the insight drawn from this research method relies on in-depth data being collection from a range of individuals (Beatty and Willis, 2007; Godderis et al., 2009). Originally, we aimed to achieve a more diverse sample (in terms of the range of answers given to the Natsal-3 questions under focus), as detailed in the qualitative

protocol (Appendix 2). However, the original Natsal-3 interview was conducted in 2010-2012, meaning that many respondents' contact details had changed making them unreachable. This meant that recruiting was not as rapid and straightforward as hoped, and so interviewing a large enough number of respondents was prioritised over only contacting those that met the criteria specified in the original protocol. As a result, in the final achieved sample there was only a single respondent who had given a 'non-autonomous' reason at first sex in the original Natsal-3 survey. Moreover, all the respondents in the sample had used a condom and/or pill at first sex, meaning no data relating non-use of reliable contraception was collected. This means that I was unable to explore how a lack of use of contraception might have impacted on the wider way respondents evaluated their first experience of sexual intercourse. Given the relatively low correlation between contraceptive use and the other psycho-social components of sexual competence identified in Chapter 6, it might have been especially valuable to interview young people who did not use contraception.

Ideally, interviewing would have continued until a point of data saturation was reached (Green and Thorogood, 2004). Although the emergence of the same themes across the diverse range of interviewees is reassuring, it is highly likely that this limited sample size will not have provided an exhaustive account of all the ways in which respondents formulate their answers to the survey questions under study. Given the commonly reported gender differences in sexual priorities, behaviours, and 'scripts' (DeLamater, 1986; Narring et al., 2000; Holland et al., 2000), I would have liked to dedicate greater analysis to examining any differences and/or similarities that emerged from men and women's accounts of their first intercourse, and their formulation of answers to the questions relating to this experience. There did seem to be a few indications of gender differences emerging from the qualitative data, such as women feeling it was more important to avoid unequal willingness at first sex due to the negative feelings that could subsequently result, whereas men seemed more concerned with the connotations of blame and rape which might be associated with an encounter not characterised by equal willingness. However, given the sample was made up of only 6 women and just 5 men, even for a qualitative study, these numbers were simply too small to qualify for an in-depth examination of gender differences and/or similarities. During the fieldwork, I felt that among men particularly, there were still new themes emerging in the final interviews, leading me to suspect that a lack of data saturation was particularly true for the young male respondents.

The age of the respondents varied from 20 to 26 years, so they had had several years of subsequent sexual experience and relationships after the occasion of first intercourse, which seemed to be drawn upon by the majority of respondents in their answers to the survey

questions about first intercourse. Due to the time which had passed since the original Natsal-3 interview (conducted in 2010-2012), the minimum age of participants available for follow-up was 18. It would have been of interest to interview respondents who engaged in their first intercourse more recently and so, would have had less experience subsequent to their first intercourse, in order to understand how they answered the questions relating to their first sex when they lacked the benefit of a longer period of hindsight and a range of other sexual experiences and relationships to act as comparators.

We cannot assume that the information produced through the interviews is a true representation of how young people go about answering these questions relating to first sex. In the original Natsal survey, participants needed to select a single answer by stating its associated numerical identifier to the interviewer, allowing for quick answers which were likely based on some inexpressible 'gut feeling'. During the in-depth cognitive interviews, participants were asked to provide a verbalisation of their thought processes, which may well have been completely sub-conscious until they were explicitly questioned as to how and why they gave that response. Mason (1996) warns of the shortcomings in the data produced through interviews:

If you are interested in people's interpretations and understandings you must bear in mind that talking to people will not enable you to get inside their heads, and that you will only be able to gain access to those interpretations and understandings which are revealed in some way in an interview" (Mason, 1996)(p. 40).

It is also important to consider how I, in my role of interviewer, may have shaped the data. I am a 26 year old woman and therefore close in age to my respondents – I felt this was of great benefit in building a rapport and good level of comfort during the interaction. After the initial preamble and form-filling, the majority of the interviews felt like a very natural conversational exchange – as one would have with a peer or friend. I felt this was particularly true with female respondents – when discussing their first sexual experience as well as the behaviour their male partner, my gender seemed important in that the respondent was able to assume mutual understanding and similar experiences. There were a few occasions, when I felt my gender may have influenced men's accounts, with what seemed to be attempts to distance oneself from the male stereotype of 'just wanting to get a leg over', which I felt may not have been emphasised had the interviewer been male. However, even if the account was to differ somewhat according to the gender of the interviewer, this does not necessarily mean that one version is more 'truthful' than the other, as the account is constructed through the interaction. I felt that as the interaction progressed and the respondents became more relaxed, there seemed to be fewer occasions of what I perceived to be impression management. This highlighted another strength

of using the prospective narrative approach – whereby the initial open account provided the time for rapport and comfort to be established and for respondents to construct a view of me as non-judgemental listener. There was one exchange whereby my status as a PhD researcher seemed to influence a participant's responses to my questions – he seemed very keen to intellectualise his ideas, seemingly feeling the need emphasise at multiple points throughout the interview his wide reading on, and observations of, the culture of sexuality.

9.1.5 Conclusions

Young people draw on a range of personal and social factors relating to the build up to, the actual encounter itself, and the events that occurred after first sex, in formulating their answers to the survey questions used to construct the measure of 'sexual competence' at sexual debut. Had these questions been aiming to tap into some stable observable reality, then this might seem to constitute a weakness in their measurement value. However, it could be argued that the concern with highly subjective and interpretable concepts such as willingness and timing, are better measured using questions that are vague enough that allow participants to interpret them in way that is salient to their own experience. For example, the question relating to 'timing' was, for some, answered with reference to the state of the self, while for others the wider relationship was more important. In allowing the individuality of answers to be accessed, we may be able to tap into the aspects of the first sexual experience that were important to that particular individual.

The finding that the physical experience and enjoyment derived from first sex was not an important feature in young persons' account and evaluation of their sexual debut suggest that the lack of a measure of enjoyment within the operationalisation of sexual competence may not constitute a threat its to content validity. It seems that although the participants placed great emphasis on importance of physical pleasure in their current everyday sex lives, the presence or absence of enjoyment was not a priority in thinking about and evaluating their first experience of intercourse. For female participants this seemed to stem from the (likely valid) assumption that their first time was not going to be particularly physically enjoyable, while for men, the emphasis seemed to lie more on 'just getting it done'.

The participants' view of chronological age being largely irrelevant for determining when some one should transition into sexual activity suggests that an approach that focuses on the context of the experience and nature of the individual in defining first intercourse is compatible with the priorities of young people. It was generally recognised that age was not necessarily consistent

with the maturity of the individual, while contextual aspects, such as the relationship between the partners could provide what were considered acceptable conditions for a younger person to have sex. Where participants stated that although there was not an ideal age at which to start having sex, there were ages that they considered to be 'too young', this was usually with reference to their discomfort at the thought of their own young relatives engaging in sexual activity.

The interviews raised questions about the use of the term '*sexual competence*'. Unsurprisingly, at no point in any of the interviews did a respondent refer to themselves as having been 'competent' or not to have sex. Furthermore, as an interviewer, there was a notable degree of discomfort in knowing that certain participants would have been labelled as 'not sexually competent' due to their answers given to the questions under study. Sandra and Emily came across as able confident young women and described how they had finally 'given in' to have sex with their first partners after continually telling that partner 'no' and that they were 'not ready for sex'. That they had had sex when their partner was more willing, to me, reflected more about their partner than them, and classifying them as non-competent at first sex felt somewhat derogatory.

The Natsal question about 'willingness' does not give the opportunity for respondents who consider themselves 'equally willing' to contemplate the nuances of the subsidiary question which presented to those who initially answer 'partner more willing'. It should be considered whether in future Natsal surveys, questions should be framed such that all respondents are aware of the options around the category 'partner more willing' since under-reporting of unequal willingness has been shown to result from concerns that 'unequally willingness' implies rape.

9.2 Summary of Chapter 9

- In formulating their answers to Natsal-3 questions used to construct the measure of sexual competence at first intercourse, young people draw on a wide range of factors, beyond solely what objectively occurred during that encounter. These factors included characteristics of the self, the partner, and the relationship, as well as what happened *after* the event of first intercourse. This suggests that the measure of sexual competence does not tap into some stable observable reality, but rather is based on responses which are constructed with reference to a wider narrative.
- Enjoyment of first intercourse did not seem to rank particularly highly in how respondent looked back on and evaluated their first time (though it was felt to be very important for sex life more generally). This may suggest the lack of an indicator of enjoyment in the current measure of sexual competence is not a threat to its content validity, as long sexual event to which it pertains is the *first*.
- Respondents felt that the characteristics of the individual and the context surrounding first sex was more important than the chronological age at which it occurred. This suggests that a concept, such as sexual competence, based on the contextual attributes of the experience may be better aligned with the priorities of young people, compared with a sole focus on age.

10. Chapter 10: Discussion, implications, and conclusions

This thesis set out to provide a comprehensive assessment of the measure of 'sexual competence' at first intercourse. The measure was constructed rather opportunistically by Wellings et al (2001) as an alternative arbiter of the onset of sexual activity. This PhD has presented the first dedicated investigation of the empirical and conceptual properties of the measure.

10.1.1 Summary of findings

As discussed in Chapter 2, the timing of first sexual intercourse has long been of public health concern. While once the concern was with sex that occurred before marriage, current emphasis in research and practice is given to chronological age, and particularly, whether first intercourse occurs before 16, the legal age of consent in Britain. Though the age of consent has not changed in over a century and has little scientific basis, the social and legal meaning of the age of 16 has been embedded in the discourse surrounding first sex. Thus, it is relied upon heavily in defining the nature of first intercourse with the implication that sex that occurs before age 16 is inherently negative, while that which occurs later is acceptable. Despite its arbitrary nature, a huge number of studies have found that the occurrence of first intercourse before 16 is associated with an extensive array of negative explanatory factors, and poor sexual health outcomes. These findings suggest that this threshold, though crude, is nonetheless salient and a useful measure in identifying those at risk of poor sexual health. However, it can be argued that age is likely to neglect differences that exist between individuals given the large variation that is known to exist in physical, mental, and emotional maturity and therefore, it is unlikely to reflect the nature of the first intercourse and interaction that occurred within the dyad.

Implicit in the focus on age in defining the nature of first sex is the perspective that sexual activity among young people is problematic. Adolescent sexuality is often viewed with concern and discomfort, and clustered alongside the use of alcohol and drugs and other types of 'problem' behaviours. However, there have been calls in the literature to recognise that the onset of sexual activity is an aspect of normative development, which if embarked upon in a safe and healthy context, is not inherently risky or negative. The measure of sexual competence, constructed by Wellings et al. (2001) sought to provide an alternative measure of first intercourse, concerned not simply with age, but the nature of the experience and its compatibility the definition of sexual health endorsed by the WHO (2006). This measure has been used in several analyses involving Natsal-2 and Natsal-3 data, has informed the construction of equivalent measures in

other large scale studies, both in the UK and internationally, and has also inspired educational and public engagement materials aimed at young people transitioning into sexual activity. This thesis has presented the first dedicated examination of the 'sexual competence' measure and its properties, finding that, despite its crude beginnings, the concept and operationalization of sexual competence has a strong empirical basis for its use in public health research and practice.

Using methods from the latent variable framework, Chapter 6 demonstrated evidence that the four items: willingness, timing, autonomy of decision, and contraceptive use, do seem tap into a single underlying construct, as hypothesised by the original construction of the variable. Furthermore, two meaningfully distinct groups of young people can be identified according to their answers to the four questions used to construct the measure of sexual competence. These findings have two main implications for the sexual competence measure: that the choice of variables combined to form the measure of sexual competence is coherent, and its operationalization as a dichotomous variable is appropriate. The analysis of data from the ALSPAC study enabled the assessment of whether 'enjoyment' of the sexual encounter might represent an additional aspect of sexual competence. The substantial limitations of this data and its comparability with Natsal have been discussed in Chapter 6 (Section 3). Nonetheless, there was evidence that this enjoyment variable also tapped into the same underlying latent construct termed 'sexual competence', though its inclusion did not improve the measurement model, and the results suggested the role of enjoyment within the construct of 'sexual competence' may be more salient for men than women.

In Chapter 7, the antecedent factors associated with sexual (non-)competence at first intercourse were explored. The findings provided evidence for the measure's external-criterion validity insofar as associations were detected between sexual competence and variables that one would expect, hypothetically, to be related to the nature of first intercourse. The finding that age at first sex was associated with sexual competence at sexual debut is an important finding; an older age at first intercourse was associated with a greater likelihood of having been sexually competent at first sex – a direction of association as expected based on a priori knowledge. However, age at first sex was not perfectly correlated with sexual competence, providing evidence to support the proposition that age alone is a crude indicator of the nature of first intercourse; younger age at first sex did not necessarily threaten one's sexual health status, while older age was not sufficient to safeguard it. The associations detected between sexual competence and other antecedent factors differed according to gender, but all behaved in the direction one might expect, for example, lower socio-economic status was associated with a lower likelihood of sexual competence at first sex, while learning about sex from school-based

education and discussion with parents about sex were both associated with a greater likelihood of having been sexually competent among women. Furthermore, the associations identified with antecedent factors were retained when adjusting for age at first sex, indicating that they were not simply a function of these external variables' association with age. The finding that relationship status at first sex and knowledge of partner's virginity status were the factors most strongly associated with sexual competence is important for identifying the contexts within in which young people may be best enabled to have a positive and safe first sexual experience. Furthermore, this may also suggest that the measure of sexual competence might be better conceptualised as tapping into the *interaction within the dyad*, as opposed to a stable trait that an individual does or does not embody – which could be inferred from the language of 'competence'.

Possibly the most important finding of this research is that the measure of sexual competence at first intercourse is associated with several indicators of subsequent sexual health: STIs and low sexual function in both genders, and unplanned pregnancy and non-volitional sex among women (Chapter 8). This provides further evidence for the measure's external criterion validity; given that the content of the measure was informed by the WHO definition of sexual health, its association with measures of several distinct aspects of sexual health is important. This association was retained when adjusting for whether sex occurred before age 16, as well as a range of other potentially confounding factors, and although causality cannot be assumed, this association may suggest that the nature of the transition into sexual activity (and not just the age at which it occurs) has implications for the subsequent sexual health of young people. This is the finding that is likely to have the most impact on the future use of this measure of sexual competence in research and has several potential implications for public health practice, discussed below.

The in-depth cognitive-style interviews provided rich data about the nuances and complexities which underlie participants' answers to the survey questions about their experience of first intercourse. The findings suggest that the Natsal-3 questions do not tap into some observable stable reality of the experience of first intercourse, but rather are answered within a much wider frame of reference encompassing aspects of the self, the partner, the relationship, and the events which occurred (and continue to occur) subsequently. A particularly noteworthy finding of relevance for future attempts to measure 'sexual competence' is the distinct lack of emphasis that these young people placed on the physical experience and enjoyment derived from their *first* intercourse – suggesting that this may not be a 'missing' component of the construct as might be expected when referring to widely cited definitions of sexual health.

10.1.2 Implications

Implications for practice

In providing an alternative and more holistic assessment of first intercourse, the concept of sexual competence highlights aspects of young people's sexual health that would have otherwise been clouded by the common reliance on the measures of age at first sex and contraceptive use at first sex. With reference to these two measures, the majority (~70%) of young people do not engage in sexual intercourse until they are over 16, and contraceptive use at first intercourse is high, approaching 90% among young people in Britain. However, only around half of young people have a first intercourse characterised by contraceptive protection *and* equal willingness *and* autonomy of decision *and* acceptable timing, peaking at ~65% among those for whom sexual debut occurred at 18-24 years. This highlights that there is much more that needs to be done to ensure that young people are transitioning into sexual activity in a way that protects their sexual health and wellbeing, as defined by the broader definition of sexual health endorsed by the WHO

In 2005, the 'R U Ready....or Not Quite Yet', formerly named 'Let's Leave It Till Later', programme was designed by Jo Adams, former director for the National Centre for HIV and Sexual health and former chair of the Sex Education Forum. Inspired by the concept of sexual competence as operationalised in Natsal-2, this programme provides training and resources for a wide range of people who work with young people, for example, social workers, sexual health educators, school teachers, doctors, nurses, counsellors, foster carers (personal communication with Dr Tara Beattie, former National Leader of the programme). The focus of the programme is 'readiness' for sex, with an emphasis on enabling young people to know when they are ready and equipping them with the skills to delay sex until then. The sexual competence measure provides four definable features of a first sexual encounter which can be considered in thinking about when and how to embark on sexual activity – and has been drawn upon in developing the 'R U Ready' checklist (shown in Appendix 12). Given that those who report a first intercourse characterised by these four features are less likely to experience poor sexual health later in life, an empirical basis for the implementation of programmes that focus on optimising the context and psycho-social experience of first sexual intercourse is provided by this thesis. The use of resources provided by this programme, such as the 'R U Ready' checklist, in several Brook sexual health clinics in Britain also demonstrates the utility of this multi-dimensional concept in encouraging and enabling dialogue about broader aspects of health and wellbeing, within a traditionally clinical setting.

The findings of this PhD have implications for the provision of sex and relationship education (SRE). Government guidance explicitly emphasises the need for SRE to reach beyond the ‘bugs and babies’ discourse of sexual health and behaviour among young people, with particular reference to the development of skills for negotiating relationships (Department for Education and Employment, 2000). However, it is these aspects which are so often missing from programmes provided in UK schools (OFSTED, 2010). The finding that the nature and experience of first intercourse, beyond just age at occurrence and contraceptive use, is associated with subsequent sexual health provides an empirical basis for a shift in the focus away from a reductionist view of sexual health, to a more holistic approach concerned with the protection and maintenance of physical, emotional, and social health from the very beginning of sexual activity.

Young people have expressed the wish that school-based sex education give greater focus to issues relating to relationships, consent, and negotiation skills (Macdowall et al., 2006). Moreover, the respondents spoken to in the qualitative component of the PhD all felt that there was no good age at which to have sex, and that the appropriateness of the onset of sexual activity was better defined with reference to the characteristics of the individual, the relationship, and the wider context. Thus, it seems reasonable to expect that a programme of sex education that focuses less on the negative clinical outcomes of sexual activity and delay in terms of chronological age, and gives more emphasis to optimising the psychosocial aspects of the transition into sexual activity, would be more likely to engage with the priorities of the young people targeted.

Implications for research

Overall, the findings presented in this thesis suggest that sexual competence performs well as a research measure – with evidence found for its content, construct, and external-criterion validity. These findings challenge the existing reliance on chronological age as the sole arbiter defining the nature of first sexual intercourse and provide support for a greater emphasis to be given the context and experience of sexual debut.

Given the strength of the empirical properties of this measure, future research concerned with describing and assessing sexual behaviour and health among young people should consider integrating the measure of sexual competence at first sex. This measure may be particularly relevant for interventional studies aiming to improve sexual health. The majority of studies

evaluating the effects of sex education and other sexual health interventions rely on outcome measures concerned with age at first sex, and behaviours directly relevant for threats to the clinical definition of sexual health, such as condom use and number of partners. The measure of sexual competence could be employed to tap in a more comprehensive type of sexual health, concerned with emotional and social aspects of health, alongside the physiological.

Age has been referred to as an 'empty variable' given that it is often used as an assumed proxy for other characteristics, such as emotional and physical maturity (Settersten Jr and Mayer, 1997). Therefore, any associations identified between age at first sex and other factors provide little in the way of hypothesising mechanisms of effect. The measure of sexual competence, however, allows greater theorisation about the mechanism at play, given that the *experience* and *context* of first sex is theoretically more likely to impact on subsequent sexual health and behaviour through the process of sexual scripting (Gagnon and Simon, 1973) and/or the development of self-efficacy (Bandura, 1995). In using a measure which may tap into something more proximal to the causal factor, the results of research may be of greater relevance to real life.

These findings should not be interpreted to suggest that age at first sex is not a useful or meaningful indicator. While the cut-off of age 16 in defining the acceptability of sexual activity may seem arbitrary, its long existence as the age of consent has no doubt imbued it with social and personal significance. Those whose sexual debut occurred before 16 are more likely to experience poor sexual health, even when adjusting for sexual competence, and therefore its utility in identify those at greater risk cannot be denied. Moreover, measuring age at first sex relies on just one relatively objective question, whereas the measure of sexual competence requires greater cognitive processing given that in practise, it not just a measure of the experience, but the subsequent interpretation of it - shaped not simply by a positivistic account of the encounter – but within a narrative of wider life experience and sexual experience.

In recommending wider use of the measure of sexual competence in research, it is important to consider the way in which it is packaged. According to the Oxford Dictionary, the definition of 'competence' is, 'the ability to do something successfully or efficiently'. Throughout the process of writing this thesis, when discussing the topic with others, their initial understanding of the term 'sexual competence' was overwhelmingly related to "how good someone is at sex". The measure and its potential utility has also received interest from a representative of the World Health Organization, however she was adamant that the term 'competence' would be unacceptable for its wider adoption in adolescent sexual health research and advocacy.

Moreover, from the in-depth interviews conducted as part of this PhD, I felt that describing someone as 'not competent' would have seemed derogatory, and it was never a term used in the accounts provided by the young respondents.

A potential alternative is 'readiness', a term that was spontaneously used in all the interview accounts, with respondents describing themselves as having been 'ready' or not. The label 'sexual readiness' has already been used by Heron et al (2013), in their study using a constructed measure broadly equivalent to Natsal's sexual competence. However, there are also pitfalls associated with 'readiness' in terms of chronology. Whilst some components of the measure occur prior to the first time, such as reason, others are more coincidental (contraceptive use and willingness), and the consideration of timing is very much retrospective. The Oxford Dictionary definition of 'ready' is, 'in suitable state for an action or situation; fully prepared' and therefore seems more suitable as a prospective descriptor – which may not be compatible with a measure that seems to rely on a substantial degree of recasting, depending on what happened afterwards (as discussed in Chapter 9). The term 'ready' also seems very individualistic. Given that the type of the relationship and the virginity status of the partner were the explanatory variables most strongly associated with sexual competence, while the accounts provided in the in-depth interviews rarely gave emphasis *only* to the state of the self as an individual, it might be more appropriate use a term that relates to the event, and the interaction between the members of the dyad, as opposed to something that seems more descriptive of a stable individual trait.

10.1.3 Limitations

One of the greatest limitations of this research is its reliance on secondary data, meaning that analyses were restricted by what data was collected. There are many other factors which would have been valuable to include in analyses of the explanatory and outcome factors associated with sexual competence at first sex. For example, individual characteristics such as self-efficacy, sensation-seeking and impulsivity were not measured in the Natsal survey, but have previously been found to be associated with early sexual intercourse and risky sexual behaviour, such as lack of contraceptive use and multiple sexual partners (Castro et al., 2011; Wulfert and Wan, 1993; Baele et al., 2001; Hoyle et al., 2000; Charnigo et al., 2012). The survey also lacked measures of other potential explanatory factors relating to sexual experiences that occurred prior to first intercourse, such as childhood sexual abuse (Meston et al., 2006; Leonard and Follette, 2002) and consensual non-coital sexual practices (Halpern-Felsher et al., 2005; O'Sullivan and Brooks-Gunn, 2005; Lewis et al., 2013).

The current analyses can only be considered to represent the properties of the sexual competence measure for first heterosexual intercourse. Vaginal intercourse is not the only form of sexual initiation, particularly for gay and lesbian young people. Research has shown that the 'first time' is an important experience for young people, regardless of sexual identity (Carpenter, 2001) – however, the current measure is limited in that it only applies to a specific type of sexual activity which occurs between a man and a woman. It is conceivable that a measure of 'sexual competence' for the first sexual experiences of gay and lesbian youths would be quite distinct.

The measure of sexual competence itself was constructed somewhat opportunistically, using existing questions in the Natsal questionnaire, rather than inductively developing a conceptual model informed by respondents' experience. This may have resulted in the omission of important components, such as experience of enjoyment from first sexual intercourse, which may be of particular importance for the way in which young men reflect on their first intercourse (Carpenter, 2002; Petersen and Hyde, 2011; DeLamater, 1986). The role of enjoyment as a potential missing aspect of sexual competence could not be assessed using Natsal-3 data, since no question on enjoyment or pleasure derived from first intercourse were included in the survey. Though efforts were made to explore this using an additional dataset, ALSPAC, the questions in this study to measure the concepts of willingness, autonomy, and timing, differed greatly from those asked in Natsal-3 and information was only available for those who had engaged in intercourse prior to age 15 ½, severely limiting the extent to which any results are comparable with Natsal-3. I had originally wanted to do much more with the ALSPAC dataset, as when I began this PhD I believed the relevant 'romantic relations' module would be included at the 17+ clinic, meaning we would have had larger sample, which was less biased towards those having sex before 16 – however, this module was not asked at the 17+ clinic, so further limiting the utility of the sample for comparative research.

The observational nature of the Natsal-3 dataset means that there are likely to be unmeasured/unknown confounding factors affecting the associations identified in the analyses presented. Reliance on retrospective reporting in the Natsal studies also has the potential to introduce recall bias. The time between the occurrence of first sexual intercourse and being interviewed can be as long as ten years among respondents aged 16-24. The interpretation of events that take place early in life is likely to be shaped by subsequent experience (as suggested by the qualitative findings), and so cannot be construed simply as rationalisation of past events (Giddens, 1992). This is not necessarily an inherent weakness of the study or the measure of sexual competence; we are not concerned with describing the experience as a fixed and

observable reality, but in terms of the way in which men and women construct and reflect on their first sexual experience. Nevertheless, the quality of one's current sex life is likely to colour recollections of past sexual experience, whether in an unfavourable or favourable light and could introduce bias in the observed associations.

The response rate to Natsal-3 was 57.7% (Erens et al., 2013), potentially limiting the representativeness of the findings presented. Although data is weighted on demographic characteristics in order to more closely reflect the wider British population, it is possible that the individuals who agree to partake in a survey of this nature differ from those that do not. However, some have argued that given that generally non-response rates are no greater for sex research than those for studies of other sensitive issues, the *sexual* nature of the survey per se may not actually bias the responses (Biggar et al., 1989; Bajos et al., 1992). The Natsal-3 response rate was similar to that of other major social surveys undertaken at the same time (Craig and Mindell, 2011; Park et al., 2012), perhaps suggesting that the *sexual* focus of the survey may not be responsible for the limited rate of response.

The qualitative component of this thesis also has its own specific limitations to note. As discussed in Chapter 9, even for a qualitative study, the sample of 11 respondents was small, and was not as diverse as originally planned. Only one interviewee had given a 'non-autonomous' reason for first sex in the Natsal-3 survey, while no interviewees reported non-use of a reliable method of contraception at first intercourse. Therefore, it is unlikely that a point of data saturation was reached. This means that the data and interpretation presented in Chapter 9 is unlikely to have provided an exhaustive account of the way in which young Natsal-3 respondents formulated their answers to the survey questions used to construct the measure of sexual competence. The small number of respondents also limited the extent to which the qualitative data could be used to make meaningful comparisons between the accounts provided by male and female respondents. When interpreting the results presented in Chapter 9, one must also consider the way in which these data were produced and how this compares to the situation of the original Natsal-3 interview. In the Natsal-3 survey, respondents were simply asked to state the numerical identifier of their given response option, meaning that their answers were likely formulated quickly in response to some inexpressible 'gut feeling'. In the in-depth cognitive interviews, participants were asked to verbalise their thought processes in answering the survey questions, and the extent to which these verbalisations are 'true' representations of the underlying process of formulating their answers cannot be assessed.

10.1.4 Future research

Using the measure of sexual competence in longitudinal research would enable greater understanding of how the measure functions at different time points since the occasion of first sex. Given that the answers to the sexual competence questions were formed within a wider narrative of life experiences, one might expect the measure to function differently when asked only a short time after first intercourse, compared with when asked many years after the occasion. How the measure relates to current sexual health status may also differ according to the time point at which it was measured. Furthermore, this would allow an assessment of the test re-test reliability of the measure – assessing the consistency of reports between different time points. Longitudinal research would also allow greater inferences of causality to be made, as well as an examination of the intervening mechanisms of effect.

The existing measure of sexual competence is useful in itself and demonstrates the promise of using context-based measure of first sex. However, the measure was retrospectively constructed using existing variables by public health researchers. A potential avenue of future research would be to take a bottom-up approach to develop a measure of first sex based on the priorities of young people in defining the ideal first sexual experience and potentially a wider range of sexual health professionals. This would involve in-depth qualitative interviews with young people to identify the conditions necessary for the ideal experience of first intercourse, which would inform the development of a range of survey questions, which could be refined using psychometric methods, resulting in a final psychometrically-validated measure of the nature of first sex.

Rather than conducting an entire re-design of the measure, there is also potential for future research to refine the existing one. In its current form, sexual competence is essentially one overall concept which is made up of four subsidiary concepts: willingness, autonomy of decision, acceptability of timing, and contraceptive use. The precision of the existing measure might be improved by developing (or using existing) more complex scales to assess each of these four underlying concepts and constructing a sexual competence scale based on those.

There may also be scope to consider the application of the measure to other sexual events, rather than just specifically *first* intercourse. The first occasion of sexual intercourse is no doubt a salient event within young peoples' sex life, but there are other sexual practices and a long period of sexual activity following that first time. The current focus specifically on *heterosexual*

intercourse also neglects same sex experiences - and therefore a substantial proportion of the population. Future research should also consider how to apply the concept to same sex encounters.

There also remains scope for further qualitative research, continuing the process of cognitive interviewing employed in Chapter 9, but with a larger and more diverse sample of interviewees in order to reach data saturation. Gender differences in sexual priorities and behaviours are frequently reported in the sexual health literature, while the quantitative analyses presented in this thesis also found evidence for differences between men and women in relation to the sexual competence measure. Therefore, it might be particularly valuable to conduct further qualitative research in order that the data collected is sufficient for a dedicated analysis of the differences and similarities in the way young men and women evaluate their first sexual intercourse, and the way in which they formulate their answers to the questions used to construct the measure of sexual competence.

There is considerable cultural, racial and ethnic variation in the timing of sexual initiation and the social and legal norms governing sexual behaviour. Further research is required to explore the extent to which the concept of sexual competence is transferrable for use in other contexts and countries, and whether alternative measures would need to be developed for different settings. For example, where the exchange of gifts for sex is the norm (Chatterji et al., 2005), there are great complexities in how one might conceptualise autonomy. The focus of current research on the chronological age at first sex is limited in the extent to which between-country comparisons can be made. The meaning of chronological age and the role of marriage in transitioning into sexual activity varies considerably by country. However, a context-based approach to first sex, considering feelings, the partner, the interactions, and the wider relationship, may actually be more generalisable; that is, a contextual measure along the lines of the Natsal's 'sexual competence' may demonstrate superior international validity and utility, compared with a focus on age.

10.1.5 Conclusions

For a rather simply constructed operationalisation of a complex concept, the measure of sexual competence at first intercourse performs well empirically. It offers an alternative criterion of the onset of sexual activity that is likely to be more consistent with the priorities of young people, compared with a focus on chronological age. The findings presented in the thesis support the concept's further integration into public health research and practice, and add to the growing

evidence base supporting the need for greater emphasis to be placed on enabling young people to protect and maintain the physical, social, and emotional aspects of their sexual health, from the onset of sexual activity.

11. Bibliography

- ABMA, J., DRISCOLL, A. & MOORE, K. 1998. Young women's degree of control over first intercourse: an exploratory analysis. *Family Planning Perspectives*, 12-18.
- AGGLETON, P. & CAMPBELL, C. 2000. Working with young people - towards an agenda for sexual health. *Sexual and Relationship Therapy*, 15, 283-296.
- ALLEN, L. & CARMODY, M. 2012. 'Pleasure has no passport': re-visiting the potential of pleasure in sexuality education. *Sex Education*, 12, 455-468.
- ALSPAC. 2008. Available: <http://www.bristol.ac.uk/alspac/sci-com/resource/represent/> [Accessed 10/10/11].
- ASPY, C. B., VESELY, S. K., OMAN, R. F., RODINE, S., MARSHALL, L. & MCLEROY, K. 2007. Parental communication and youth sexual behaviour. *Journal of adolescence*, 30, 449-466.
- AVERT. 2011. *Worldwide Ages of Consent* [Online]. Available: <http://www.avert.org/age-of-consent.htm> [Accessed 16/01/12].
- BAELE, J., DUSSELDORP, E. & MAES, S. 2001. Condom use self-efficacy: effect on intended and actual condom use in adolescents. *Journal of Adolescent Health*, 28, 421-431.
- BAILES, S., CRETI, L., FICHTEN, C. S., LIBMAN, E., BRENDER, W., AMSEL, R. & DAVIS, C. 1998. Sexual Self-Efficacy Scale for Female Functioning. In: YARBER, W. L., BAUSERMAN, R. & SCHREER, G. (eds.) *Handbook of sexuality-related measures*.
- BAILIS, D. S., SEGALL, A., MAHON, M. J., CHIPPERFIELD, J. G. & DUNN, E. M. 2001. Perceived control in relation to socioeconomic and behavioral resources for health. *Social Science & Medicine*, 52, 1661-1676.
- BAJOS, N., SPIRA, A., DUCOT, B. & MESSIAH, A. 1992. Analysis of sexual behaviour in France (ACSF): A comparison between two modes of investigation: Telephone survey and face-to-face survey. *Aids*.
- BANDURA, A. 1971. Social Learning Theory.
- BANDURA, A. 1995. *Self-efficacy in changing societies*, Cambridge University Press.
- BANDURA, A. 1998. Health promotion from the perspective of social cognitive theory. *Psychology and Health*, 13, 623-649.
- BARRETT, G. 2002. *Developing a measure of unplanned pregnancy*. PhD, London School of Hygiene and Tropical Medicine.
- BARRETT, G., SMITH, S. C. & WELLINGS, K. 2004. Conceptualisation, development, and evaluation of a measure of unplanned pregnancy. *Journal of Epidemiology and Community Health*, 58, 426-433.
- BARTHOLOMEW, D., STEELE, F., GALBRAITH, J. & MOUSTAKI, I. 2008. *Analysis of multivariable social science data*, New York, Taylor and Francis.
- BAUMAN, L. J. & BERMAN, R. 2005. Adolescent relationships and condom use: Trust, love and commitment. *AIDS and Behavior*, 9, 211-222.
- BEARINGER, L. H., SIEVING, R. E., FERGUSON, J. & SHARMA, V. 2007. Global perspectives on the sexual and reproductive health of adolescents: patterns, prevention, and potential. *The Lancet*, 369, 1220-1231.
- BEASLEY, C. 2008. The challenge of pleasure: Re-imagining sexuality and sexual health. *Health Sociology Review*, 17, 151-163.
- BEATTY, P., WILLIS, G. & SCHECHTER, S. Evaluating the generalizability of cognitive interview findings. Office of Management and Budget Seminar on Statistical Methodology in the Public Service, Statistical Policy Working Paper, 1997. 353-362.
- BEATTY, P. C. & WILLIS, G. B. 2007. Research Synthesis: The Practice of Cognitive Interviewing. *Public Opinion Quarterly*, 71, 287-311.
- BEAUDUCEL, A. & HERZBERG, P. Y. 2006. On the Performance of Maximum Likelihood Versus Means and Variance Adjusted Weighted Least Squares Estimation in CFA. *Structural Equation Modeling: A Multidisciplinary Journal*, 13, 186-203.

- BEITCHMAN, J. H., ZUCKER, K. J., HOOD, J. E., DACOSTA, G. A., AKMAN, D. & CASSAVIA, E. 1992. A review of the long-term effects of child sexual abuse. *Child abuse & neglect*, 16, 101-118.
- BELSKY, J., STEINBERG, L. & DRAPER, P. 1991. Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child development*, 62, 647-670.
- BERNAT, F. 2011. Age of Consent. . In: CHAMBLISS, W. (ed.) *Key Issues in Crime and Punishment: Crime and Criminal Behavior*. Thousand Oaks, CA: SAGE Publications, Inc.
- BERSAMIN, M. M., FISHER, D. A., WALKER, S., HILL, D. L. & GRUBE, J. W. 2007. Defining virginity and abstinence: adolescents' interpretations of sexual behaviors. *Journal of Adolescent Health*, 41, 182-188.
- BIGGAR, R. J., BRINTON, L. A. & ROSENTHAL, M. D. 1989. Trends in the number of sexual partners among American women. *JAIDS Journal of Acquired Immune Deficiency Syndromes*, 2, 497-502.
- BISSETT, S. L., HOWELL-JONES, R., SWIFT, C., DE SILVA, N., BISCORNET, L., PARRY, J. V., SAUNDERS, N. A., NATHAN, M., SOLDAN, K. & SZAREWSKI, A. 2011. Human papillomavirus genotype detection and viral load in paired genital and urine samples from both females and males. *Journal of medical virology*, 83, 1744-1751.
- BLENKINSOP, S., WADE, P., BENTON, T., GNALDI, M. & SCHAGEN, S. 2004. Evaluation of the APAUSE SRE Programme. *National Foundation for Educational Research. UK*.
- BLUNT, H. 2012. "People aren't mind readers": A study of sexual self-concept, partner communication, and sexual satisfaction. PhD, University of South Florida.
- BONELL, C., ALLEN, E., STRANGE, V., COPAS, A., OAKLEY, A., STEPHENSON, J. & JOHNSON, A. 2005. The effect of dislike of school on risk of teenage pregnancy: testing of hypotheses using longitudinal data from a randomised trial of sex education. *British Medical Journal*, 59, 223.
- BONELL, C., FLETCHER, A. & MCCAMBRIDGE, J. 2007. Improving school ethos may reduce substance misuse and teenage pregnancy. *BMJ: British Medical Journal*, 334, 614.
- BOSMA, H., SCHRIJVERS, C. & MACKENBACH, J. P. 1999. Socioeconomic inequalities in mortality and importance of perceived control: cohort study. *BMJ*, 319, 1469-1470.
- BROMNICK, R. & SWINBURN, P. 2003. Young people's social representations of a sexual experience. *Journal of Adolescence*, 26, 375-379.
- BROWN, T. A. 2006. *Confirmatory factor analysis for applied research*, Guilford Press.
- BROWNING, C. R., BURRINGTON, L. A., LEVENTHAL, T. & BROOKS-GUNN, J. 2008. Neighborhood Structural Inequality, Collective Efficacy, and Sexual Risk Behavior among Urban Youth. *Journal of Health and Social Behavior*, 49, 269-285.
- BURGARD, S. A. & LEE-RIFE, S. M. 2009. Community Characteristics, Sexual Initiation, and Condom Use among Young Black South Africans. *Journal of Health and Social Behavior*, 50, 293-309.
- CAMOLETTO, F. R. 2011. Sexual beginners: accounting for first sexual intercourse in Italian young people's heterosexual biographies. *Sex Education*, 11, 315-325.
- CARPENTER, L. M. 2001. The ambiguity of "having sex": the subjective experience of virginity loss in the United States -- statistical data included. *Journal of Sex Research*, 38, 127-139.
- CARPENTER, L. M. 2002. Gender and the meaning and experience of virginity loss in the contemporary United States. *Gender & Society*, 16, 345-365.
- CARPENTER, L. M. & GARCIA, L. 2007. Virginity lost: an intimate portrait of first sexual experiences. *American journal of sociology*, 113, 294-296.
- CASPI, A., BEGG, D., DICKSON, N., HARRINGTON, H., LANGLEY, J., MOFFITT, T. E. & SILVA, P. A. 1997. Personality differences predict health-risk behaviors in young adulthood: evidence from a longitudinal study. *Journal of personality and social psychology*, 73, 1052.

- CASTRO, A., BERMUDEZ, M., BUELA-CASAL, G. & MADRID, J. 2011. Psychosocial variables related to sexual debut in adolescents in Spain. *Revista Latinoamericana De Psicología*, 43, 83-94.
- CHARNIGO, R., NOAR, S. M., GARNETT, C., CROSBY, R., PALMGREEN, P. & ZIMMERMAN, R. S. 2012. Sensation seeking and impulsivity: Combined associations with risky sexual behavior in a large sample of young adults. *Journal of sex research*, 1-9.
- CHATTERJI, M., MURRAY, N., LONDON, D. & ANGLEWICZ, P. 2005. The factors influencing transactional sex among young men and women in 12 sub-Saharan African countries. *Biodemography and Social Biology*, 52, 56-72.
- CHIMBIRI, A. M. 2007. The condom is an 'intruder' in marriage: Evidence from rural Malawi. *Social Science & Medicine*, 64, 1102-1115.
- COLEMAN, L. & TESTA, A. 2007. Sexual health knowledge, attitudes and behaviours among an ethnically diverse sample of young people in the UK. *Health Education Journal*, 66, 68-81.
- COLLINS, R. L., ELLIOTT, M. N., BERRY, S. H., KANOUSE, D. E., KUNKEL, D., HUNTER, S. B. & MIU, A. 2004. Watching sex on television predicts adolescent initiation of sexual behavior. *Pediatrics*, 114, E280-E289.
- COOPER, M. L. 2010. Toward a person x situation model of sexual risk-taking behaviors: illuminating the conditional effects of traits across sexual situations and relationship contexts. *J Pers Soc Psychol*, 98, 319-41.
- COSENZA, C. & FOWLER, F. Prospective questions and other issues in cognitive testing. Proceedings of the Survey Research Methods Section, American Statistical Association 2000. 994-997.
- COUSENS, S., HARGREAVES, J., BONELL, C., ARMSTRONG, B., THOMAS, J., KIRKWOOD, B. R. & HAYES, R. 2009. Alternatives to randomisation in the evaluation of public-health interventions: statistical analysis and causal inference. *Journal of Epidemiology and Community Health*.
- CRAIG, R. & MINDELL, J. 2011. Health Survey for England 2010—volume 1: respiratory health, The NHS Information Centre, Leeds.
- CRIMINAL LAW AMENDMENT ACT. 1885. Available: <http://archive.org/details/criminallawamen00bodkgoog> [Accessed 02/09 2013].
- CROCKETT, L. J., BINGHAM, C. R., CHOPAK, J. S. & VICARY, J. R. 1996. Timing of first sexual intercourse: the role of social control, social learning, and problem behavior. *Journal of Youth and Adolescence*, 25, 89-111.
- CRONBACH, L. J. 1951. Coefficient alpha and the internal structure of tests. *Psychometrika*, 16, 297-334.
- CRONBACH, L. J. & MEEHL, P. E. 1955. Construct validity in psychological tests. *Psychological bulletin*, 52, 281.
- CUFFEE, J. J., HALLFORS, D. D. & WALLER, M. W. 2007. Racial and gender differences in adolescent sexual attitudes and longitudinal associations with coital debut. *Journal of Adolescent Health*, 41, 19-26.
- CUNNINGTON, A. J. 2001. What's so bad about teenage pregnancy? *Journal of Family Planning and Reproductive Health Care*, 27, 36-41.
- DE SANJOSE, S., CORTES, X., MENDEZ, C., PUIG-TINTORE, L., TORNE, A., ROURA, E., BOSCH, F. X. & CASTELLSAGUE, X. 2008. Age at sexual initiation and number of sexual partners in the female Spanish population Results from the AFRODITA survey. *European Journal of Obstetrics Gynecology and Reproductive Biology*, 140, 234-240.
- DEFUR, K. M. 2012. Getting to the Good Stuff: Adopting a Pleasure Framework for Sexuality Education. *American Journal of Sexuality Education*, 7, 146-159.
- DELAMATER, J. 1986. Gender differences in sexual scenarios. In: KELLY, K. (ed.) *Females, males, and sexuality*. Albany, NJ: SUNY Press.
- DEPARTMENT FOR EDUCATION AND EMPLOYMENT 2000. Sex and Relationship Education Guidance. Crown Copyright.

- DEPARTMENT FOR SCHOOLS CHILDREN AND FAMILIES & DEPARTMENT OF HEALTH 2010. The Teenage Pregnancy Strategy: Beyond 2010. Crown Copyright.
- DEPARTMENT OF HEALTH 2001. Better prevention, better services, better sexual health: The national strategy for sexual health and HIV. Crown copyright.
- DEPARTMENT OF HEALTH 2004. Best practice guidance for doctors and other health professionals on the provision of advice and treatment to young people under 16 on contraception, sexual and reproductive health. London: Department of Health.
- DEVELLIS, R. F. 2003. *Scale Development: Theory and Applications*, London, Sage Publications.
- DICKSON, N., PAUL, C., HERBISON, P. & SILVA, P. 1998. First sexual intercourse: age, coercion, and later regrets reported by a birth cohort. *BMJ*, 316, 29-33.
- DIXON-MUELLER, R. 1993. The sexuality connection in reproductive health. *Studies in family planning*, 269-282.
- DONOHEW, L., ZIMMERMAN, R., CUPP, P. S., NOVAK, S., COLON, S. & ABELL, R. 2000. Sensation seeking, impulsive decision-making, and risky sex: implications for risk-taking and design of interventions. *Personality and Individual Differences*, 28, 1079-1091.
- DONOVAN, J. & JESSOR, R. 1985. Structure of problem behaviour in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology*, 53, 890-904.
- DUNCAN, S. 2007. What's the problem with teenage parents? And what's the problem with policy? *Critical Social Policy*, 27, 307-334.
- DUNN, T. J., BAGULEY, T. & BRUNSDEN, V. 2013. From alpha to omega: A practical solution to the pervasive problem of internal consistency estimation. *British Journal of Psychology*.
- DWORKIN, S. L. & O'SULLIVAN, L. F. 2007. "It's less work for us and it shows us she has good taste": Masculinity, sexual initiation, and contemporary sexual scripts. *Kimmel, Michael [Ed]*, 105-121.
- EBERHART-PHILLIPS, J. E., DICKSON, N. P., PAUL, C., HERBISON, G. P., TAYLOR, J. & CUNNINGHAM, A. L. 2001. Rising incidence and prevalence of herpes simplex type 2 infection in a cohort of 26 year old New Zealanders. *Sexually transmitted infections*, 77, 353-357.
- EDWARDS, W. M. & COLEMAN, E. 2004. Defining sexual health: a descriptive overview. *Archives of Sexual Behavior*, 33, 189-195.
- ELLIS, B. J., BATES, J. E., DODGE, K. A., FERGUSON, D. M., JOHN HORWOOD, L., PETTIT, G. S. & WOODWARD, L. 2003. Does father absence place daughters at special risk for early sexual activity and teenage pregnancy? *Child development*, 74, 801-821.
- ELSE-QUEST, N. M., HYDE, J. S. & DELAMATER, J. D. 2005. Context counts: Long-term sequelae of premarital intercourse or abstinence. *The Journal of Sex Research*, 102-112.
- ERENS, B., PHELPS, A. & CLIFTON, S. 2013. The third National Survey of Sexual Attitudes and Lifestyles (Natsal-3): technical report.
- EVANS, D. 2006. "We do not use the word 'crisis' lightly...": sexual health policy in the United Kingdom. *Policy Studies*, 27, 235-52.
- FELTON, G. M. & BARTOCES, M. 2002. Predictors of initiation of early sex in black and white adolescent females. *Public Health Nurs*, 19, 59-67.
- FENTON, K., MERCER, C., MCMANUS, S., ERENS, B., BYRON, C., COPAS, A., NANCHAHAL, K., MACDOWALL, W., WELLINGS, K. & JOHNSON, A. 2005. Sexual behaviour in Britain: ethnic variations in high-risk behaviour and STI acquisition risk. *The Lancet*, 365, 1246-1255.
- FICHTEN, C. S., SPECTOR, I., AMSEL, R., CRETI, L., BRENDER, W. & LIBMAN, E. 1998. Sexual self-efficacy scale-erectile functioning. In: YARBER, W. L., BAUSERMAN, R. & SCHREER, G. (eds.) *Handbook of sexuality-related measures*. London: Sage.
- FINCH, W. H. & BRONK, K. C. 2011. Conducting Confirmatory Latent Class Analysis Using M plus. *Structural Equation Modeling*, 18, 132-151.
- FINE, M. 1988. Sexuality, schooling, and adolescent females: The missing discourse of desire. *Harvard educational review*, 58, 29-54.

- FRANK, P., MCNAMEE, R., HANNAFORD, P. C., KAY, C. R. & HIRSCH, S. 1993. The effect of induced abortion on subsequent fertility. *BJOG: An International Journal of Obstetrics & Gynaecology*, 100, 575-580.
- FRIESEN, M. D., WOODWARD, L. J., HORWOOD, L. J. & FERGUSON, D. M. 2010. Childhood exposure to sexual abuse and partnership outcomes at age 30. *Psychological Medicine*, 40, 679-688.
- GAGNON, J. H. & SIMON, W. 1973. Sexual conduct: The social sources of human sexuality. Aldine Pub. Co.(Chicago).
- GEBHARDT, W. A., KUYPER, L. & DUSSELDORP, E. 2006. Condom use at first intercourse with a new partner in female adolescents and young adults: the role of cognitive planning and motives for having sex. *Archives of Sexual Behavior*, 35, 217-223.
- GEBHARDT, W. A., KUYPER, L. & GREUNSVEN, G. 2003. Need for intimacy in relationships and motives for sex as determinants of adolescent condom use. *Journal of Adolescent Health*, 33, 154-164.
- GIDDENS, A. 1992. *The transformation of intimacy: sexuality, love and eroticism in modern societies*, Cambridge, Polity Press.
- GLOPPEN, K. M., DAVID-FERDON, C. & BATES, J. 2010. Confidence as a Predictor of Sexual and Reproductive Health Outcomes for Youth. *Journal of Adolescent Health*, 46, S42-S58.
- GODDERIS, R., ADAIR, C. E. & BRAGER, N. 2009. Applying new techniques to an old ally: A qualitative validation study of the Edinburgh Postnatal Depression Scale. *Women and Birth*, 22, 17-23.
- GOVERNMENT OF CANADA. 2008. *Age of Consent to Sexual Activity* [Online]. <http://www.justice.gc.ca/eng/rp-pr/other-autre/clp/faq.html>. [Accessed 16/04/2014].
- GRAHAM, J. M. 2006. Congeneric and (Essentially) Tau-Equivalent Estimates of Score Reliability: What They Are and How to Use Them. *Educational and Psychological Measurement*, 66, 930-944.
- GRAUPNER, H. 2000. Sexual consent: The criminal law in Europe and overseas. *Archives of Sexual Behavior*, 29, 415-461.
- GRAY, S. H., AUSTIN, S. B., HUANG, B., FRAZIER, A. L., FIELD, A. E. & KAHN, J. A. 2008. Predicting sexual initiation in a prospective cohort study of adolescents. *Archives of Pediatrics and Adolescent Medicine*, 162, 55-59.
- GRAYSON, C. 2005. Adolescents and sex: the handbook for professionals working with young people. *Archives of Disease in Childhood*, 90, 1099-1099.
- GREEN, J. & BROWNE, J. 2005. *Principles of social research*, McGraw-Hill International.
- GREEN, J. & THOROGOOD, N. 2004. *Qualitative methods for health research*, Sage Publications Ltd.
- GREEN, S. B. & YANG, Y. 2009. Commentary on coefficient alpha: A cautionary tale. *Psychometrika*, 74, 121-135.
- GROSS, K. H. 2009. Adolescent Sexual Competence: a Paradigm Shift. *Family Science Review*, 14.
- GUGGINO, J. M. & PONZETTI, J. J., JR. 1997. Gender differences in affective reactions to first coitus. *Journal of Adolescence*, 20, 189-200.
- GUILFORD, J. P. 1954. Psychometric methods.
- HALPERN-FELSHER, B. L., CORNELL, J. L., KROPP, R. Y. & TSCHANN, J. M. 2005. Oral Versus Vaginal Sex Among Adolescents: Perceptions, Attitudes, and Behavior. *Pediatrics*, 115, 845-851.
- HALPERN, C. T. 2010. Reframing research on adolescent sexuality: healthy sexual development as part of the life course. *Perspectives on Sexual and Reproductive Health*, 42, 6-7.
- HANSEN, W. B., PASKETT, E. D. & CARTER, L. J. 1999. The Adolescent Sexual Activity Index (ASAI): a standardized strategy for measuring interpersonal heterosexual behaviors among youth. *Health Education Research*, 14, 485.

- HARRISON, A., CLELAND, J., GOUWS, E. & FROHLICH, J. 2005. Early sexual debut among young men in rural South Africa: heightened vulnerability to sexual risk? *Sexually Transmitted Infections*, 81, 259-261.
- HEINRICHS, K. D. 2007. *An investigation of female sexual self-esteem in heterosexual, pre-menopausal women enaged in continuous long-term relationships*. Graduate Counselling Psychology Program Master of the Arts, Trinity Western University.
- HELWEG-LARSEN, K., SUNDARAM, V., CURTIS, T. & LARSEN, H. B. 2004. The Danish Youth Survey 2002: asking young people about sensitive issues. *International journal of circumpolar health*, 63.
- HENDERSON, M., WIGHT, D., RAAB, G., ABRAHAM, C., BUSTON, K., HART, G. & SCOTT, S. U. E. 2002. Heterosexual risk behaviour among young teenagers in Scotland. *Journal of Adolescence*, 25, 483-494.
- HERNÁN, M. A., HERNÁNDEZ-DÍAZ, S., WERLER, M. M. & MITCHELL, A. A. 2002. Causal knowledge as a prerequisite for confounding evaluation: an application to birth defects epidemiology. *American journal of epidemiology*, 155, 176-184.
- HERON, J., LOW, N., LEWIS, G., MACLEOD, J., NESS, A. & WAYLEN, A. 2013. Social Factors Associated with Readiness for Sexual Activity in Adolescents: A Population-Based Cohort Study. *Archives of sexual behavior*, 1-10.
- HIGGINS, J. A. & HIRSCH, J. S. 2007. The pleasure deficit: revisiting the "sexuality connection" in reproductive health. *Perspectives on Sexual and Reproductive Health*, 39, 240-247.
- HIGGINS, J. A., TRUSSELL, J., MOORE, N. B. & DAVIDSON, J. K. 2010. Virginity Lost, Satisfaction Gained? Physiological and Psychological Sexual Satisfaction at Heterosexual Debut. *Journal of Sex Research*, 47, 384 - 394.
- HIRST, J. 2008. Developing sexual competence? Exploring strategies for the provision of effective sexualities and relationships education. *Sex Education*, 8, 399-413.
- HIRST, J. 2012. 'It's got to be about enjoying yourself': young people, sexual pleasure, and sex and relationships education. *Sex Education*, 1-14.
- HITCHENS, R. & JAMES, E. B. 1965. Premarital intercourse, venereal disease and young people: Recent trends. *Public health*, 79, 258-270.
- HOLLAND, J., RAMAZANOGLU, C., SHARPE, S. & THOMSON, R. 2000. Deconstructing virginity— young people's accounts of first sex... Reprinted from Sexual and Relationship Therapy, Vol. 15, No. 3, 2000, 221–232. *Sexual & Relationship Therapy*, 25, 351-362.
- HORVATH, P. & ZUCKERMAN, M. 1993. Sensation seeking, risk appraisal, and risky behavior. *Personality and individual differences*, 14, 41-52.
- HOYLE, R. H., FEJFAR, M. C. & MILLER, J. D. 2000. Personality and sexual risk taking: A quantitative review. *Journal of Personality*, 68, 1203-1231.
- HUMBLET, O., PAUL, C. & DICKSON, N. 2003. Core group evolution over time: high-risk sexual behavior in a birth cohort between sexual debut and age 26. *Sexually transmitted diseases*, 30, 818-824.
- HUMPHREYS, T. P. 2012. Cognitive Frameworks of Virginity and First Intercourse.
- HUYSAMEN, G. 2006. Coefficient alpha: Unnecessarily ambiguous; unduly ubiquitous. *SA Journal of Industrial Psychology*, 32, p. 34-40.
- HYDE, A., DRENNAN, J., HOWLETT, E. & BRADY, D. 2008. Heterosexual experiences of secondary school pupils in Ireland : sexual coercion in context. *Culture, health and sexuality*, 10, 479-493.
- INGHAM, R. 1994. Some speculations on the concept of rationality. *Advances in Medical Sociology*, 4, 89-111.
- INGHAM, R. & VAN ZESSEN, G. 1997. From individual properties to interactional processes. *Sexual interactions and HIV risk: New conceptual perspectives in European research*, 83-99.
- INGHAM, R., WOODCOCK, A. & STENNER, K. 1991. Getting to know you... young people's knowledge of their partners at first intercourse. *Journal of Community & Applied Social Psychology*, 1, 117-132.

- JABINE, T. B., STRAF, M., TANUR, J. & TOURANGEAU, R. 1984. *Cognitive aspects of survey methodology: building a bridge between disciplines*, Washington, DC, National Academy Press.
- JACKSON, S. 1998. Feminist politics, gay politics and the problem of heterosexuality. *Politics of sexuality: Identity, gender, citizenship*, 4, 68.
- KAESTLE, C. E., HALPERN, C. T., MILLER, W. C. & FORD, C. A. 2005. Young age at first sexual intercourse and sexually transmitted infections in adolescents and young adults. *American Journal of Epidemiology*, 161, 774-780.
- KAHN, J. A., KAPLOWITZ, R. A., GOODMAN, E. & EMANS, S. J. 2002a. The association between impulsiveness and sexual risk behaviors in adolescent and young adult women. *Journal of Adolescent Health*, 30, 229-32.
- KAHN, J. A., ROSENTHAL, S. L., SUCCOP, P. A., HO, G. Y. & BURK, R. D. 2002b. Mediators of the association between age of first sexual intercourse and subsequent human papillomavirus infection. *Pediatrics*, 109, e5-e5.
- KASS, R. E. & RAFTERY, A. E. 1995. Bayes factors. *Journal of the american statistical association*, 90, 773-795.
- KATZ, M. H. 2011. *Multivariable analysis: a practical guide for clinicians and public health researchers*, Cambridge university press.
- KATZ, R. C., GIPSON, M. T., KEARL, A. & KRISKOVICH, M. 1989. Assessing sexual aversion in college students: The Sexual Aversion Scale. *Journal of sex & marital therapy*, 15, 135-140.
- KEITH, J., FRY, C. L., GLASCOCK, A. P., IKELS, C., DICKERSON-PUTMAN, J., HARPENDING, H. C. & DRAPER, P. 1994. *The aging experience: Diversity and commonality across cultures*, Sage Thousand Oaks, CA.
- KEYS, D., ROSENTHAL, D. & PITTS, M. 2006. Young people, sexual practice and meanings. In: AGGLETON, P., BALL, A. & MANE, P. (eds.) *Sex, Drugs and Young People*. New York: Routledge.
- KIERNAN, K. E. & HOBBCRAFT, J. 1997. Parental divorce during childhood: age at first intercourse, partnership and parenthood. *Population Studies*, 51, 41-55.
- KIM, K. & SMITH, P. 1999. Family relations in early childhood and reproductive development. *Journal of reproductive and infant psychology*, 17, 133-148.
- KIRBY, D. 2002. The impact of schools and school programs upon adolescent sexual behavior. *The Journal of Sex Research*, 27-33.
- KIRBY, D. B. 2001. Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy, National Campaign to Prevent Teen Pregnancy, Washington, DC.
- KIRBY, D. B., LARIS, B. & ROLLERI, L. A. 2007. Sex and HIV education programs: their impact on sexual behaviors of young people throughout the world. *Journal of Adolescent Health*, 40, 206-217.
- KLAVS, I., RODRIGUES, L. C., WEISS, H. A. & HAYES, R. 2006. Factors associated with early sexual debut in Slovenia: results of a general population survey. *Sexually Transmitted Infections*, 82, 478-483.
- KLAVS, I., RODRIGUES, L. C., WELLINGS, K., WEISS, H. A. & HAYES, R. 2005. Increased condom use at sexual debut in the general population of Slovenia and association with subsequent condom use. *Aids*, 19, 1215-1223.
- KLINE, P. 1986. *A handbook of test construction: Introduction to psychometric design*, Methuen.
- KOTCHICK, B. A., SHAFFER, A., MILLER, K. S. & FOREHAND, R. 2001. Adolescent sexual risk behavior: a multi-system perspective. *Clinical Psychology Review*, 21, 493-519.
- L'ENGLE, K. L., JACKSON, C. & BROWN, J. D. 2006. Early adolescents' cognitive susceptibility to initiating sexual intercourse. *Perspectives on Sexual and Reproductive Health*, 38, 97-105.

- LAMMERS, C., IRELAND, M., RESNICK, M. & BLUM, R. 2000. Influences on adolescents' decision to postpone onset of sexual intercourse: a survival analysis of virginity among youths aged 13 to 18 years. *Journal of Adolescent Health*, 26, 42-8.
- LAYTE, R. & MCGEE, H. 2007. Regret about the timing of first sexual intercourse: The role of age and context. Working Paper, The Economic and Social Research Institute (ESRI), Dublin.
- LENCIAUSKIENE, I. & ZABORSKIS, A. 2008. The effects of family structure, parent-child relationship and parental monitoring on early sexual behaviour among adolescents in nine European countries. *Scandinavian Journal of Public Health*, 36, 607-618.
- LEONARD, L. M. & FOLLETTE, V. M. 2002. Sexual Functioning in Women Reporting a History of Child Sexual Abuse: Review of the Empirical Literature and Clinical Implications. *Annual Review of Sex Research*, 13, 346-388.
- LEWIS, R., MARSTON, C. & WELLINGS, K. 2013. Bases, Stages and 'Working Your Way Up': Young People's Talk About Non-Coital Practices and 'Normal' Sexual Trajectories. *Sociological Research Online*, 18, 1.
- MACDOWALL, W., WELLINGS, K., MERCER, C. H., NANCHAHAL, K., COPAS, A. J., MCMANUS, S., FENTON, K. A., ERENS, B. & JOHNSON, A. M. 2006. Learning About Sex: Results From Natsal 2000. *Health Education & Behavior*, 33, 802-811.
- MADKOUR, A. S., DE LOOZE, M., MA, P., HALPERN, C. T., FARHAT, T., TER BOGT, T. F. M., EHLINGER, V., NIC GABHAINN, S., CURRIE, C. & GODEAU, E. 2014. Macro-Level Age Norms for the Timing of Sexual Initiation and Adolescents' Early Sexual Initiation in 17 European Countries. *The Journal of adolescent health : official publication of the Society for Adolescent Medicine*.
- MAHRAJ, P. & CLELAND, J. 2005. Risk perception and condom use among married or cohabiting couples in KwaZulu-Natal, South Africa. *International family planning perspectives*, 31.
- MANLOVE, J. S., TERRY-HUMEN, E., IKRAMULLAH, E. N., MOORE, K. A. 2006. The Role of Parent Religiosity in Teens' Transitions to Sex and Contraception. *Journal of Adolescent Health*, 39 (4) 578-58
- MÅRDH, P.-A., CREATSAS, G., GUASCHINO, S., HELLBERG, D. & HENRY-SUCHET, J. 2000. Correlation between an early sexual debut, and reproductive health and behavioral factors: a multinational European study. *The European Journal of Contraception and Reproductive Health Care*, 5, 177-182.
- MARTIN, K. A. 1996. *Puberty, sexuality, and the self: Boys and girls at adolescence*, Psychology Press.
- MASON, J. 1996. *Qualitative Researching*, SAGE Publications.
- MCDONALD, R. P. 1999. *Test theory: A unified treatment*, Psychology Press.
- MCNAMEE, R. 2003. Confounding and confounders. *Occupational and Environmental Medicine*, 60, 227-234.
- MERCER, C. H., FENTON, K. A., JOHNSON, A. M., COPAS, A. J., MACDOWALL, W., ERENS, B. & WELLINGS, K. 2005. Who reports sexual function problems? Empirical evidence from Britain's 2000 National Survey of Sexual Attitudes and Lifestyles. *Sexually Transmitted Infections*, 81, 394-399.
- MERCER, C. H., TANTON, C., PRAH, P., ERENS, B., SONNENBERG, P., CLIFTON, S., MACDOWALL, W., LEWIS, R., FIELD, N. & DATTA, J. 2013. Changes in sexual attitudes and lifestyles in Britain through the life course and over time: findings from the National Surveys of Sexual Attitudes and Lifestyles (Natsal). *The Lancet*, 382, 1781-1794.
- MERCER, C. H., WELLINGS, K., MACDOWALL, W., COPAS, A. J., MCMANUS, S., ERENS, B., FENTON, K. A. & JOHNSON, A. M. 2006. First Sexual Partnerships-Age Differences and Their Significance: Empirical Evidence from the 2000 British National Survey of Sexual Attitudes and Lifestyles (Natsal 2000). *Journal of Adolescent Health*, 39, 87-95.

- MESTON, C. M., RELINI, A. H. & HEIMAN, J. R. 2006. Women's history of sexual abuse, their sexuality, and sexual self-schemas. *Journal of Consulting and Clinical Psychology*, 74, 229.
- MITCHELL, K. & WELLINGS, K. 1998. First sexual intercourse: anticipation and communication. Interviews with young people in England. *Journal of Adolescence*, 21, 717-726.
- MITCHELL, K. & WELLINGS, K. 2002. The role of ambiguity in sexual encounters between young people in England. *Culture, health & sexuality*, 393-408.
- MITCHELL, K. R., MERCER, C. H., PLOUBIDIS, G. B., JONES, K. G., DATTA, J., FIELD, N., COPAS, A. J., TANTON, C., ERENS, B. & SONNENBERG, P. 2013. Sexual function in Britain: findings from the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *The Lancet*, 382, 1817-1829.
- MITCHELL, K. R., PLOUBIDIS, G. B., DATTA, J. & WELLINGS, K. 2012. The Natsal-SF: a validated measure of sexual function for use in community surveys. *European journal of epidemiology*, 27, 409-418.
- MOORE, N. B. & DAVIDSON, J. K. 1997. Guilt about first intercourse: An antecedent of sexual dissatisfaction among college women. *Journal of Sex & Marital Therapy*, 23, 29-46.
- MORGAN, E. M. & ZURBRIGGEN, E. L. 2007. Wanting sex and wanting to wait: Young adults' accounts of sexual messages from first significant dating partners. *Feminism and Psychology*, 17, 515.
- MURPHY, G. H. & O'CALLAGHAN, A. 2004. Capacity of adults with intellectual disabilities to consent to sexual relationships. *Psychological Medicine*, 34, 1347-1357.
- MUTHÉN, B. O. 1998-2004. Mplus technical appendices (8). Los Angeles, CA: Muthén & Muthén.
- MUTHÉN, L. K. & MUTHÉN, B. 1998-2012. *Mplus User's Guide. Seventh Edition.*, Los Angeles, CA, Muthén and Muthén.
- MUTHEN, L. K. & MUTHEN, B. O. 2007. Mplus user's guide. 5th. Los Angeles, CA: Muthén & Muthén, 197-200.
- NARRING, F., WYDLER, H. & MICHAUD, P. A. 2000. First sexual intercourse and contraception: a cross-sectional survey on the sexuality of 16-20-year-olds in Switzerland. *Schweizerische Medizinische Wochenschrift. Journal Suisse de Medecine*, 130, 1389-98.
- NEUGARTEN, B. L. & HAGESTAD, G. O. 1976. Age and the Life Course. In: BINSTOCK, R. & SHANAS, E. (eds.) *Handbook of Aging and Social Sciences*. New York: Van Nostrand Reinhold.
- NEUGARTEN, B. L., MOORE, J. W. & LOWE, J. C. 1965. Age norms, age constraints, and adult socialization. *American journal of Sociology*, 710-717.
- NHS WEBSITE. 2009. *Sex. Worth Talking About - Are you ready for sex?* [Online]. Available: <http://www.nhs.uk/Livewell/Sexandyoungpeople/Pages/Readytogoalltheway.aspx> [Accessed 10/08/2011].
- NUNNALLY, J. C. 1970. Introduction to psychological measurement. New York: McGraw-Hill Book Company.
- NYLUND, K. L., ASPAROUHOV, T. & MUTHÉN, B. O. 2007. Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, 14, 535-569.
- O'SULLIVAN, L. F. & BROOKS-GUNN, J. 2005. The timing of changes in girls' sexual cognitions and behaviors in early adolescence: a prospective, cohort study. *Journal of Adolescent Health*, 37, 211-219.
- OFFENCES AGAINST THE PERSON ACT. 1861. Available: <http://www.legislation.gov.uk/ukpga/Vict/24-25/100/contents> [Accessed 02/09 2013].
- OFFICE FOR NATIONAL STATISTICS. 2012. *Families and Households – Statistical Bulletin* [Online]. Crown Copyright. Available: http://www.ons.gov.uk/ons/dcp171778_284823.pdf [Accessed 11/09/2013].

- OTT, M. A., MILLSTEIN, S. G., OFNER, S. & HALPERN-FELSHER, B. L. 2006. Greater expectations: Adolescents' positive motivations for sex. *Perspectives on sexual and reproductive health*, 38, 84-89.
- PAOLUCCI, E. O., GENUIS, M. L. & VIOLATO, C. 2001. A Meta-Analysis of the Published Research on the Effects of Child Sexual Abuse. *The Journal of Psychology*, 135, 17-36.
- PAPAHARITOU, S., NAKOPOULOU, E., HATZICHRISTOU, D. & MORAITOU, M. 2011. The experience of First Sexual Intercourse: an Exploratory Study in Greek Women. *International Journal of Caring Sciences*, 4, 162-169.
- PARK, A., CLERY, E., CURTICE, J., PHILLIPS, M. & UTTING, D. 2012. British social attitudes: the 28th report, NatCen Social Research, London.
- PARKER, R. 2009. Sexuality, culture and society: shifting paradigms in sexuality research. *Culture, Health & Sexuality*, 11, 251-266.
- PARKES, A., HENDERSON, M., WIGHT, D. & NIXON, C. 2011. Is Parenting Associated with Teenagers' Early Sexual Risk-Taking, Autonomy And Relationship with Sexual Partners? *Perspectives on Sexual and Reproductive Health*, 43, 30-40.
- PARKES, A., WAYLEN, A., SAYAL, K., HERON, J., HENDERSON, M., WIGHT, D. & MACLEOD, J. 2014. Which behavioral, emotional and school problems in middle-childhood predict early sexual behavior? *Journal of youth and adolescence*, 43, 507-527.
- PAUL, C., FITZJOHN, J., HERBISON, P. & DICKSON, N. 2000. The determinants of sexual intercourse before age 16. *Journal of Adolescent Health*, 27, 136-147.
- PAYNE, R. A. & ABEL, G. A. 2012. UK indices of multiple deprivation—a way to make comparisons across constituent countries easier. *Health Stat Q*, 53, 22-37.
- PEARSON, M. R., KHOLODKOV, T., HENSON, J. M. & IMPETT, E. A. 2012. Pathways to early coital debut for adolescent girls: a recursive partitioning analysis. *Journal of Sex Research*, 49, 13-26.
- PELTZER, K. 2010. Early sexual debut and associated factors among in-school adolescents in eight African countries. *Acta Pædiatrica*, 99, 1242-1247.
- PETERS, G.-J. Y. 2014. The alpha and the omega of scale reliability and validity. *Marta Marques & Kyra Hamilton* 36, 56.
- PETERSEN, J. L. & HYDE, J. S. 2011. Gender Differences in Sexual Attitudes and Behaviors: A Review of Meta-Analytic Results and Large Datasets. *Journal of Sex Research*, 48, 149-165.
- PETERSON, C. C. 1996. The ticking of the social clock: Adults' beliefs about the timing of transition events. *The International Journal of Aging and Human Development*, 42, 189-203.
- PHILPOTT, A., KNERR, W. & MAHER, D. 2006. Promoting protection and pleasure: Amplifying the effectiveness of barriers against sexually transmitted infections and pregnancy. *The Lancet*.
- POLICY ADVISORY COMMITTEE 1981. *Report on the age of consent in relation to sexual offences*, HMSO.
- PRICE, M. N. & HYDE, J. S. 2009. When Two Isn't Better Than One: Predictors of Early Sexual Activity in Adolescence Using a Cumulative Risk Model. *Journal of Youth and Adolescence*, 38, 1059-1071.
- PUBLIC HEALTH ENGLAND. 2012. *Sexually transmitted infections and chlamydia screening in England* [Online]. London. Available: <http://www.hpa.org.uk/stiannualdatatables> [Accessed 15/10 2013].
- RAYKOV, T. 1997. Scale reliability, Cronbach's coefficient alpha, and violations of essential tau-equivalence with fixed congeneric components. *Multivariable Behavioral Research*, 32, 329-353.
- REISS, I. L. 1965. Social class and premarital sexual permissiveness: A re-examination. *American Sociological Review*, 747-756.

- REISSING, E. D., ANDRUFF, H. L. & WENTLAND, J. J. 2012. Looking back: the experience of first sexual intercourse and current sexual adjustment in young heterosexual adults. *Journal of Sex Research*, 49, 27-35.
- RITCHIE, J. & SPENCER, L. 1994. Qualitative data analysis for applied policy research. *Analyzing qualitative data (1994)* Bryman, Alan; Burgess, Robert G.. London and New York: Routledge.
- ROBERTSON, S. 2013. "Age of Consent Laws" [Online]. Available: Item #230, <http://chnm.gmu.edu/cyh/teaching-modules/230> (accessed August 22, 2013).
- ROBINS, J. M. 2001. Data, design, and background knowledge in etiologic inference. *Epidemiology*, 12, 313-320.
- ROSENTHAL, S. L., VON RANSON, K. M., COTTON, S., BIRO, F. M. & MILLS, L. 2001. Sexual initiation: predictors and developmental trends. *Sexually Transmitted Diseases*, 28, 527-32.
- ROSTOSKY, S. S., WILCOX, B. L., WRIGHT, M. L. C., RANDALL, B. A. 2004. The impact of Religiosity on Adolescent Sexual Behavior: A Review of the Evidence. *Journal of Adolescent Research*, 19, 677-697
- ROWLANDS, S. 2011. Misinformation on abortion. *The European Journal of Contraception and Reproductive Health Care*, 16, 233-240.
- RUIZ, Á. M., RUIZ, J. E., GAVILANES, A. V., ERIKSSON, T., LEHTINEN, M., PÉREZ, G., SINGS, H. L., JAMES, M. K., HAUPT, R. M., I, F. T. F. & GROUP, I. S. 2012. Proximity of First Sexual Intercourse to Menarche and Risk of High-Grade Cervical Disease. *Journal of Infectious Diseases*, 206, 1887-1896.
- SANTELLI, J. S., WARREN, C. W., LOWRY, R., SOGOLOW, E., COLLINS, J., KANN, L., KAUFMANN, R. B. & CELENTANO, D. D. 1997. The use of condoms with other contraceptive methods among young men and women. *Family planning perspectives*, 261-267.
- SAWYER, R. & SMITH, N. 1996. A survey of situational factors at first intercourse among college students. *American Journal of Health Behavior*, 20, 208.
- SCHUBOTZ, D., ROLSTON, B. & SIMPSON, A. 2004. Sexual behaviour of young people in Northern Ireland: first sexual experience. *Critical Public Health*, 14, 177-190.
- SCHWARTZ, I. 1999. Sexual Activity Prior to Coital Initiation: A Comparison Between Males and Females. *Archives of Sexual Behavior*, 28, 63-69.
- SCHWARTZ, I. M. 1998. First Coital Affective Reaction Scale. In: YARBER, W. L., BAUSERMAN, R. & SCHREER, G. (eds.) *Handbook of sexuality-related measures*. London: Sage.
- SETTERSTEN JR, R. A. & MAYER, K. U. 1997. The measurement of age, age structuring, and the life course. *Annual Review of Sociology*, 23(1), 233-261.
- SEXUAL OFFENCES (AMENDMENT) ACT. 2000. Available: <http://www.legislation.gov.uk/ukpga/2000/44/contents> [Accessed 16/04/2014].
- SEXUAL OFFENCES ACT. 2003. Available: <http://www.legislation.gov.uk/ukpga/2003/42/notes/contents> [Accessed 02/09 2013].
- SHAFII, T., STOVEL, K., DAVIS, R. & HOLMES, K. 2004. Is condom use habit forming?: Condom use at sexual debut and subsequent condom use. *Sexually Transmitted Diseases*, 31, 366-72.
- SHAFII, T., STOVEL, K. & HOLMES, K. 2007. Association between condom use at sexual debut and subsequent sexual trajectories: A longitudinal study using biomarkers. *American Journal of Public Health*, 97, 1090-1095.
- SHEERAN, P., ABRAHAM, C. & ORBELL, S. 1999. Psychosocial correlates of heterosexual condom use: a meta-analysis. *Psychological bulletin*, 125, 90.
- SIEVING, R. E., EISENBERG, M. E., PETTINGELL, S. & SKAY, C. 2006. Friends' influence on adolescents' first sexual intercourse. *Perspectives on Sexual & Reproductive Health*, 38, 13-9.
- SIJTSMAN, K. 2009. On the use, the misuse, and the very limited usefulness of Cronbach's alpha. *Psychometrika*, 74, 107-120.

- SILVA, P. A. 1990. The Dunedin multidisciplinary health and development study: a 15 year longitudinal study. *Paediatric and Perinatal Epidemiology*, 4, 76-107.
- SINGH, S., WULF, D., SAMARA, R. & CUCA, Y. P. 2000. Gender differences in the timing of first intercourse: Data from 14 countries. *International Family Planning Perspectives*, 26, 21-+.
- SKINNER, S., SMITH, J., FENWICK, J., FYFE, S. & HENDRIK, J. 2008. Perceptions and experiences of first sexual intercourse in Australian adolescent females. *Journal of Adolescent Health*, 43, 593-599.
- SMILER, A. P., WARD, L. M., CARUTHERS, A. & MERRIWETHER, A. 2005. Pleasure, empowerment, and love: Factors associated with a positive first coitus. *Sexuality Research and Social Policy*, 2, 41-55.
- SMITH, C. V. & SHAFFER, M. J. 2013. Gone But Not Forgotten: Virginity Loss and Current Sexual Satisfaction. *Journal of Sex & Marital Therapy*, 39, 96-111.
- SMITH, D. & ROBERTS, R. 2011. Social inequality and young pregnancy; the causal attributions of young parents in London, UK. *Health & Place*.
- SOCIAL EXCLUSION UNIT 1999. The Teenage Pregnancy Strategy. The Stationary Office Limited.
- SONNENBERG, P., CLIFTON, S., BEDDOWS, S., FIELD, N., SOLDAN, K., TANTON, C., MERCER, C. H., DA SILVA, F. C., ALEXANDER, S. & COPAS, A. J. 2013. Prevalence, risk factors, and uptake of interventions for sexually transmitted infections in Britain: findings from the National Surveys of Sexual Attitudes and Lifestyles (Natsal). *The Lancet*, 382, 1795-1806.
- SPRECHER, S., BARBEE, A. & SCHWARTZ, P. 1995. "Was it good for you, too?": Gender differences in first sexual intercourse experiences. *Journal of Sex Research*, 32, 3-15.
- SPRIGGS, A. L. & HALPERN, C. T. 2008. Timing of Sexual Debut and Initiation of Postsecondary Education by Early Adulthood. *Perspectives on Sexual and Reproductive Health*, 40, 152-161.
- STEINBERG, L. 2005. Cognitive and affective development in adolescence. *Trends in Cognitive Sciences*, 9, 69-74.
- STONE, N. & INGHAM, R. 2002. Factors affecting British teenagers' contraceptive use at first intercourse: The importance of partner communication. *Perspectives on Sexual and Reproductive Health*, 191-197.
- STREINER, D. L. & NORMAN, G. R. 1995. *Health measurement scales: a practical guide to their development and use*, Oxford university press.
- STULHOFER, A., BACAK, V., AJDUKOVIC, D. & GRAHAM, C. 2010. Understanding the association between condom use at first and most recent sexual intercourse: An assessment of normative, calculative, and habitual explanations. *Social Science & Medicine*, 70, 2080-2084.
- SVARE, E. I., KJAER, S. K., POLL, P. & BOCK, J. E. 1997. Determinants for contraceptive use in young, single, Danish women from the general population. *Contraception*, 55, 287-294.
- TESTA, A., COLEMAN, L., TRUST FOR THE STUDY OF ADOLESCENCE & NAZ PROJECT LONDON 2006. Sexual Health Knowledge, Attitudes and Behaviours among Black and Minority Ethnic Youth in London: a summary of findings.
- THE OFFICE FOR STANDARDS IN EDUCATION, C. S. S. A. S. O. 2010. Personal, social, health and economic education in schools. Crown Copyright.
- THOMSON, R. 2004. 'An Adult Thing'? Young People's Perspectives on the Heterosexual Age of Consent. *Sexualities*, 7, 133-149.
- THORP, J. M. J., HARTMANN, K. E. & SHADIGIAN, E. 2003. Long-Term Physical and Psychological Health Consequences of Induced Abortion: Review of the Evidence. *Obstetrical & Gynecological Survey*, 58, 67-79.
- TOLMAN, D. L. & MCCLELLAND, S. I. 2011. Normative Sexuality Development in Adolescence: A Decade in Review, 2000–2009. *Journal of Research on Adolescence*, 21, 242-255.
- TOURANGEAU, R. 1984. Cognitive science and survey methods: A cognitive perspective. In: JABINE, T., STRAF, M., TANUR, J. & TOURANGEAU, R. (eds.) *Cognitive aspects of survey*

- methodology: Building a bridge between disciplines*. Washington, DC: National Academy Press.
- TSUI, L. & NICOLADIS, E. 2004. Losing it: similarities and differences in first intercourse experiences of men and women. *Canadian Journal of Human Sexuality*, 13, 95-106.
- VALLE, A.-K., TORGENSEN, L., RØYSAMB, E., KLEPP, K.-I. & THELLE, D. S. 2005. Social class, gender and psychosocial predictors for early sexual debut among 16 year olds in Oslo. *The European Journal of Public Health*, 15, 185-194.
- VALLE, A. K., ROYSAMB, E., SUNDBY, J. & KLEPP, K. I. 2009. Parental social position, body image, and other psychological determinants and first sexual intercourse among 15- and 16-year olds. *Adolescence*, 44, 479-498.
- VANWESENBEECK, I., VAN ZESSENZ, G., INGHAM, R., JARAMAZOVI, E. & STEVENS, D. 1999. Factors and processes in heterosexual competence and risk: an integrated review of the evidence. *Psychology & Health*, 14, 25-50.
- WAITES, M. 2004. The Age of Consent and Sexual Consent. In: COWLING, M. & REYNOLDS, P. (eds.) *Making sense of sexual consent*. Ashgate Pub Ltd.
- WAITES, M. 2005. *The age of consent: young people, sexuality, and citizenship*, Palgrave Macmillan.
- WALKOWITZ, J. R. 1992. *City of dreadful delight: Narratives of sexual danger in late-Victorian London*, University of Chicago Press.
- WALSH, J. L., WARD, L. M., CARUTHERS, A. & MERRIWETHER, A. 2011. Awkward or Amazing Gender and Age Trends in First Intercourse Experiences. *Psychology of Women Quarterly*, 35, 59-71.
- WELLES, C. E. 2005. Breaking the Silence Surrounding Female Adolescent Sexual Desire. *Women & Therapy*, 28, 31-45.
- WELLINGS, F., NANCHAHAL, K., MACDOWALL, W., MCMANUS, S., ERENS, B., MERCER, C. H., JOHNSON, A. M., COPAS, A. J., KOROVISSIS, C., FENTON, F. A. & FIELD, J. 2001. Sexual behaviour in Britain: early heterosexual experience. *Lancet*, 358, 1843-1850.
- WELLINGS, K. & BRADSHAW, A. 1994. First intercourse between men and women. In: JOHNSON, A., WADSWORTH, J., WELLINGS, K. & FIELD, J. (eds.) *Sexual Attitudes and Lifestyles*. Oxford: Blackwell Scientific Publications.
- WELLINGS, K., COLLUMBIEN, M., SLAYMAKER, E., SINGH, S., HODGES, Z., PATEL, D. & BAJOS, N. 2006. Sexual behaviour in context: a global perspective. *The Lancet*, 368, 1706-1728.
- WELLINGS, K. & JOHNSON, A. M. 2013. Framing sexual health research: adopting a broader perspective. *The Lancet*, 382, 1759-1762.
- WELLINGS, K., JONES, K. G., MERCER, C. H., TANTON, C., CLIFTON, S., DATTA, J., COPAS, A. J., ERENS, B., GIBSON, L. J. & MACDOWALL, W. 2013. The prevalence of unplanned pregnancy and associated factors in Britain: findings from the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *The Lancet*, 382, 1807-1816.
- WHEELER, R. 2006. Gillick or Fraser? A plea for consistency over competence in children: Gillick and Fraser are not interchangeable. *BMJ: British Medical Journal*, 332, 807.
- WHINCUP, P., GILG, J., ODOKI, K., TAYLOR, S. & COOK, D. 2001. Age of menarche in contemporary British teenagers: survey of girls born between 1982 and 1986. *Bmj*, 322, 1095-1096.
- WHITTEN, K. L., REIN, M. F., LAND, D. J., REPPUCCI, N. D. & TURKHEIMER, E. 2003. The emotional experience of intercourse and sexually transmitted diseases - A decision-tree analysis. *Sexually Transmitted Diseases*, 30, 348-356.
- WHO 2006. Defining sexual health: report of a technical consultation on sexual health, 28-31 January 2002, Geneva.
- WHO AND UNFPA 2010. Measuring sexual health: conceptual and practical considerations and related indicators. Geneva, Switzerland.
- WIGHT, D., PARKES, A., STRANGE, V., ALLEN, E., BONELL, C. & HENDERSON, M. 2008. The Quality of Young People's Heterosexual Relationships: A Longitudinal Analysis of

- Characteristics Shaping Subjective Experience. *Perspectives on Sexual and Reproductive Health*, 40, 226-237.
- WIGHT, D., RAAB, G. M., HENDERSON, M., ABRAHAM, C., BUSTON, K., HART, G. & SCOTT, S. 2002. Limits of teacher delivered sex education: interim behavioural outcomes from randomised trial. *BMJ*, 324, 1430.
- WIGHT, D., WILLIAMSON, L. & HENDERSON, M. 2006. Parental influences on young people's sexual behaviour: A longitudinal analysis. *Journal of Adolescence*, 29, 473-494.
- WILLIS, G. 2005. Cognitive Interviewing: A Tool for Improving Questionnaire Design. London: Sage Publications Ltd.
- WILLIS, G. B. 1999. Cognitive interviewing: A "how to" guide. *Research Triangle Park, NC: Research Triangle Institute*. .
- WILSON, B. F. & PETERSON, L. S. Using the NCHS cognitive lab to help design cycle VI of the national survey of family growth. Proceedings of the Survey Research Methods Section, American Statistical Association 1999. 997-1002.
- WULFERT, E. & WAN, C. K. 1993. Condom use: A self-efficacy model. *Health Psychology*, 12, 346.
- YANG, C.-C. 2006. Evaluating latent class analysis models in qualitative phenotype identification. *Computational Statistics & Data Analysis*, 50, 1090-1104.
- YU, C.-Y. 2002. *Evaluating cutoff criteria of model fit indices for latent variable models with binary and continuous outcomes*. University of California Los Angeles.
- ZABA, B., PISANI, E., SLAYMAKER, E. & BOERMA, J. T. 2004. Age at first sex: understanding recent trends in African demographic surveys. *Sexually transmitted infections*, 80, ii28-ii35.
- ZIMMER-GEMBECK, M. J. & HELFAND, M. 2008. Ten years of longitudinal research on U.S. adolescent sexual behavior: Developmental correlates of sexual intercourse, and the importance of age, gender and ethnic background. *Developmental Review*, 28, 153-224.

12. Appendices

Appendix 1: Topic guide for qualitative interviews

Topic guide (V.4)

- ✓ Introduce self and LSHTM
 - ✓ Introduce study and aims of interview
 - ✓ Check: Informed consent complete; obtain permission to record
 - ✓ Check: understanding of how data will be used; obtain permission to use anonymised quotes
 - ✓ Emphasize: Interviewer has not seen questionnaire so some questions will repeat survey questions
 - ✓ Emphasize: No right or wrong answers. Opinions and experience valued
 - ✓ Length of interview – usually about an hour
 - ✓ Thank you voucher
 - ✓ Voluntary nature of taking part and right to refuse to take part or answer a specific question
 - ✓ Recording of interview – just helps me to remember what you’ve said and means I don’t have to take lots of notes. – I will jot down notes during the interview – but these are to remind myself of things I want to ask you about.
 - ✓ Reassure re sensitivity of topic – no obligation to answer any question
 - ✓ Offer opportunity for respondent to ask any questions
-

Who am I?

I’m a researcher. I have no medical training and I’m not a therapist – I’m just really interested in what they have to say about their experiences. This is part of a larger project – my PhD – which has been going on for almost 4 years, and the findings will be written up and potentially published.

Questions?

****THROUGHOUT INTERVIEW** - POINTS OF INTEREST:**

- **AGE** - When they talk about age – probe - ask if they think there is a ‘good’ age to start having sex?
- **Feeling ‘READY’** - When they use the word ‘ready’, ask what they mean – what is being ‘ready’? How do you know if you’re ‘ready’?

Background

- Tell me a little about what is going on in your life?

Probes:

- How do you like to spend your time?
- Family/ household characteristics – who do you live with?
- Main occupation – currently studying? What subject? Or working? Where?
- How did you find taking part in the Natsal interview?

First sex

Introduce terms use: what do you understand by the term ‘sex’

For sake of this interview – referring to penile-vaginal intercourse, unless otherwise stated – check if there is any other language the participant would prefer to use.

I’d like you to tell me about the first time you had sex – think of it as a story you’re telling me – and include as much detail as you can.

Probes:

How did you meet? – knew each other for long? In a relationship? How long?

Had you and her kissed before? Done other sexual stuff before?

Do you know if it was your partner’s first time too? Talked with partner about what they’ve done before?

Did you know it [sex] was going to happen? When? How? Talked about it?

Had you been wanted to have sex for a while? Why?

How was it?

How did feel you after? About the sex? About the partner? About yourself?

Did you tell anyone that it had happened? Friends? Family? Why?

Looking back, how do you feel about it now? Is there anything you’d change about the experience?

The Natsal questions

Thinking back to when you completed the Natsal interview, you were asked a few questions relating to the first time you had sexual intercourse – I am going to ask a few of these questions again. I am interested in your answers to these questions, and particularly, how you went about answering these questions for example what thoughts popped into your mind when thinking about your first time and how did you make the decision to choose to give a certain answer to a question....

LET THEM KNOW – I don't know what they answered in the survey and I don't expect them to remember what they answered either!

Willingness

- Natsal question:

Would you say that you were both equally willing to have intercourse that first time, or was one of you more willing than the other?

IF ONE MORE WILLING: Who was more willing?

- 1 *Both equally willing*
- 2 *Respondent more willing*
- 3 *Partner more willing*

Ask for their answer and talk through how they decided on it – how did they know they were 'equally willing' or not

*If they find it hard to verbalise how they know they were equally willing – can be useful to ask them what unequally willing might look like.

Probes:

- How did you decide on your answer: *both equally willing/ partner more willing?*
- What were the main factors that made you decide on this answer?
- How do you think that first sexual partner would have answered this question?
- What do you think the question is asking? – repeat question in own words
- What does 'willing' mean to you? What about unwilling?
- How do you think you can tell whether a person is willing or not to have sex?
- How easy or difficult was it for you to answer this question?
- Do you think the three answer categories in this question are enough? Should there be other answer categories? If so, what?
- What do you think you would have answered if I had asked you the day after you first had sex?
- Do you think it's important for both partners to be equally willing at first sex?

Contraception

- Natsal question:

Still thinking of that first time you had sexual intercourse, did you or your partner use any form of contraception or take any precautions that first time, or not?

CODE ALL THAT APPLY. PROBE: What else?

- 1 *Condom (Sheath/Durex)*
- 2 *The pill*
- 3 *Emergency contraception*
- 4 *Other contraception*
- 5 *(partner) withdrew*
- 6 *Made sure it was a safe period*
- 7 *No precautions by me, don't know about partner*
- 8 *No precautions by either of us*

Often not a huge amount to talk about for this one – but find out when and where they got the contraceptive – as might be indicative of some kind of pre-planning – and for condom, how did they get to the point at which the condom was put on? The ‘have you got a condom question?’ can sometimes a way of checking whether sex is on the cards.

- How easy or difficult was it for you to answer this question?
- Pill – communicated this with partner? Knew you were going to have sex?
- Condom – why had condoms? Expected sex? Proper use – put on before penetration?

Timing

- Natsal question:

Looking back now to the first time you had sexual intercourse, do you think ...READ OUT...

- 1 *...you should have waited longer before having sex with anyone,*
- 2 *or, that you should not have waited so long,*
- 3 *or, was it at about the right time?*

Probes:

- When answering this question, what were you thinking about? How did you decide that it was the right time/you should have waited longer?
- What were the main factors that made you decide on this answer? – What made it the ‘right time?’ OR if not the ‘right time’, what would have been the ‘right time?’
- What do you think the question is asking? Repeat in own words
- What does the ‘right time’ to have sex mean to you? Do you think other people might think of the ‘right time’ differently?
- Easy or difficult to know when it’s the ‘right’ time to have sex?
- Could you try and repeat the question in your own words?
- Do you think that the person you had sex with that first time would also think that she/he should have waited longer/ that is happened at about the right time?
- What factors are important in deciding whether a person should have waited longer before having sex with anyone or that is was about the right time?
- How easy or difficult was it for you to answer this question?
- Do you think the three answer categories in this question are enough? Should there be other answer categories? If so, what?
- If you could do it all again, is there anything at all you would have changed about that first time you had sex?
- FOR THOSE WHO SAID *SHOULD HAVE WAITED LONGER BEFORE HAVING SEX WITH ANYONE*, how do feel about that first time you had sex? Here – interested in whether they would say they ‘regret’ it or not.
- What do you think you would have answered if I had asked you this the day after you had sex?
- Do you think it’s important that first sex should happen only when it’s the ‘right time’?

Reason

- Natsal question:

*Which of these things applied to you **at the time**?*

*Please choose the **main** one that applied at the time.*

CODE ONE ONLY.

- 1 *I was curious about what it would be like*
- 2 *I was carried away by my feelings*
- 3 *Most people in my age group seemed to be doing it*
- 4 *It seemed like a natural 'follow on' in the relationship*
- 5 *I was a bit drunk at the time*
- 6 *I had smoked some cannabis*
- 7 *I had taken some other drugs*
- 8 *I wanted to lose my virginity*
- 9 *I was in love*
- 10 *Other particular factor (SPECIFY)*
- 11 *Can't choose/more than one main factor*
- 12 *Can't remember*

Probes:

- When answering this question, what were you thinking about? How decided on answer? E.g. what was it that made it feel like the 'natural follow-on'?
- Did more than one of these apply to you at the time? Which ones? Why? How did you decide that ***** was the *main* one that applied?
- What do you think the question is asking? Repeat in own words
- Would you say that this was a reason for why you had sex? Would you say it was the main reason?
- How easy or difficult was it for you to answer this question?
- What do you think you would have answered if I had asked you this the day after you had sex?
- Do you think the answer categories in this question are enough? Should there be other answer categories? If so, what?
- Go through the list – and ask respondent to decide if each is a 'good' or 'bad' reason to have sex for the first time – and explain why?

Overall measure

Show cards which have each of the four questions on.

- Do you think that this set of questions capture everything you wanted to say about first sex?
- Do you think there is anything about the experience of first sex that is missing? If so, what?
- If it doesn't come up, ask about the importance of the physical experience/enjoyment
- In terms of the way you think about that first time you had sex, can you order the cards in how important they are for the way you feel about your first sex? – Talk through why in that order?
- Then – if there was a question about enjoyment, where would that fit in their ordering?
- Would anything about the ordering change if about sex life in general – not the first time?
- Finally, if a person said that they had a good positive first sex, how do you think they would have answered the four questions?

Ending

You've answered all my questions now

Is there anything you else you want to mention about the first time you had sex? Or anything else that we've talked about?

Any questions?

Appendix 2: Protocol for qualitative research

Research Protocol: 'Sexual Competence': a critical assessment of a public health measure.

Melissa Palmer BSc MSc

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Supervisors: Kaye Wellings and Lynda Clarke

Protocol for Qualitative Research

The qualitative component of this PhD will consist of 14 cognitive interviews, conducted with the aim of gaining an understanding of how Natsal-3 participants formulated their answers to the survey questions that make up the measure of 'sexual competence'.

This component will follow up a subsample of Natsal-3 participants. The combination of quantitative and qualitative data within a common sample will provide for both statistical exploration of the 'sexual competence' measure included in Natsal, and also, a qualitative account of how the questions making up this combined variable work on the ground. Consideration will be given to interpretation and understanding of the questions asked, as well as how respondents reflect on their own experiences before choosing the predefined answer which best represents their own experiences. It is anticipated that findings will inform our understanding of what the measure of 'sexual competence' is actually measuring, and may advance future attempts to formulate improved measures of 'sexual competence'.

Aim

The aim of this qualitative component is to provide insights into how the four survey questions which contribute to the measure of sexual competence are answered by Natsal respondents. A sample of respondents will be selected with the aim of representing a range of possible answer combinations to the questions under study and to include both men and women. Specific criteria governing selection of respondents are outlined below:

- Uniqueness of data: little qualitative research currently exists and the sample could not easily be identified by another means;
- Adequate sample size: we estimate that there will be a large enough subsample of Natsal-3 participants to meet our target of 14 respondents;
- Scientific interest: data will increase understanding of how accounts of first sexual experience are formulated.

Methodology

Research design

Qualitative follow-up study of a subsample of participants in the main survey who meet the specific criteria outlined above using face-to-face, in-depth cognitive interviews.

Sampling strategy

The sampling frame comprises participants in Natsal-3 who expressed willingness to be re-contacted to take part in further research and who were aged between 16-24 at interview.

Relevant variables from Natsal-3 will be used to identify individuals selected for interview (Table a1). Roughly 14 individuals in total will be interviewed. The sample will include respondents who gave a range of different answers to the four survey questions under study, will include both men and women of different ages at interview, who were different ages at first sexual intercourse and will represent regional variation.

Recruitment of participants

Respondents in Natsal-3 are asked whether they would be willing for a researcher to contact them again about taking part in a further interview. Specifically they are asked, 'It is possible that we may want to contact you again to obtain further information about some of the topics covered in this study. Would you be willing for a researcher from the study to contact you again about taking part in another interview?' If the respondent asks for clarification, the interviewer adds: 'You do not have to say now whether you would actually do an interview, just whether it would be OK for us to contact you about it. The study team is a team of researchers at the National Centre for Social Research, University College London, and the London School of Hygiene and Tropical Medicine.' Response options are 'yes' and 'no'.

Individuals will be invited to take part in a further interview by letter which will be followed up about a week later with a telephone call from one of the research team giving more details about what is involved and, if the individual is willing to participate, arranging a suitable time, date and venue for an interview.

Data collection

Semi-structured, cognitive interviews will be carried out by the principal investigator (Melissa Palmer) and the two project supervisors (Professor Kaye Wellings and Lynda Clarke), lasting up to 90 minutes. Interviews will take place in private (unless the participant prefers otherwise) at participants' homes or at another place of their choice. Researcher safety will be taken into account and may influence place of interview. With participants' permission, interviews will be audio-recorded and transcribed verbatim. At the close of the interview participants will be asked if they would be willing for the interviewer to view their Natsal-3 questionnaire responses. This will enable data triangulation between interview and survey formats. Participants will be given a £20 high street voucher in appreciation for their time and contribution to the study and any travel costs will be reimbursed. Interviews will cover variables of specific relevance to the research question.

Data analysis

Qualitative data derived from interviews will be transcribed verbatim. The framework approach will be used to assist thematic analysis, which will be conducted principally by Melissa Palmer, with input from Kaye Wellings and Lynda Clarke. Analysis will be aided by the use of NVivo software.

Ethical considerations

Participants will be requested to provide information of a personal and sensitive nature and so key considerations include maintenance of confidentiality and the adoption of a non-judgmental approach. In-depth interviews will be carried out in private at a time and place convenient to participants. Participants will be assured that the study is confidential and entirely voluntary, and that data will be anonymised. Participants will be given information about the study and asked to sign a consent form before taking part).

Identifying information will not be stored with the original audio recordings and will be removed from transcripts. Recordings and transcripts will be assigned a study identification number, and will be password protected and stored securely on computers at LSHTM. When the findings of the study are published, quotes from the interview transcripts will be reported anonymously and some contextual details may be altered when using direct quotes in order to preserve confidentiality. Emphasis will be placed on the fact that information provided will not be attributed to any individual and participants will be not be identifiable. Protection against the disclosure of respondent identities is built into all stages of the Natsal-3 process. All research team members work for institutions which are notified under the Data Protection Act 1998, and comply with all its obligations. A list of relevant referral agencies will be given to all participants should they need help with issues raised in interviews.

Dissemination

Dissemination will be in line with Natsal-3 dissemination plan and will include mixed method papers in peer-reviewed journals and presentations to both academic and policy audiences.

Research team

Melissa Palmer, Kaye Wellings and Lynda Clarke.

Participant	Equal willingness	Autonomous reason	No Regret (right time)	Contraception	Gender	Other details	Coding	N in dataset
1	1	1	1	1	Female	13, 14 or 15 at fs	(zbothwill==1) & (peers==0 & drunk==0 & smkcann==0 & othdrg==0) & (zrttime==3) & (fscondom==1 | fspill==1) & (afsex==13 | afsex==14 | afsex==15) & (rsex==2) & (agrp==1) & (tottot==2 | tottot==3 | tottot==4 | tottot==5) & (intagain==1)	162
2	1	1	1	1	Female	16, 17 or 18 at fs	(zbothwill==1) & (peers==0 & drunk==0 & smkcann==0 & othdrg==0) & (zrttime==3) & (fscondom==1 | fspill==1) & (afsex==16 | afsex==17 | afsex==18) & (rsex==2) & (agrp==1) & (tottot==2 | tottot==3 | tottot==4 | tottot==5) & (intagain==1)	332
3	1	1	1	1	Male	13, 14 or 15 at fs	(zbothwill==1) & (peers==0 & drunk==0 & smkcann==0 & othdrg==0) & (zrttime==3) & (fscondom==1 | fspill==1) & (afsex==13 | afsex==14 | afsex==15) & (rsex==1) & (agrp==1) & (tottot==2 | tottot==3 | tottot==4 | tottot==5) & (intagain==1)	196
4	1	1	1	1	Male	16, 17 or 18 at fs	(zbothwill==1) & (peers==0 & drunk==0 & smkcann==0 & othdrg==0) & (zrttime==3) & (fscondom==1 | fspill==1) & (afsex==16 | afsex==17 | afsex==18) & (rsex==1) & (agrp==1) & (tottot==2 | tottot==3 | tottot==4 | tottot==5) & (intagain==1)	289
5	1	1	0	0 or 1	Female		(zbothwill==1) & (peers==0 & drunk==0 & smkcann==0 & othdrg==0) & (zrttime==1 | zrttime==2) & (rsex==2) & (agrp==1) & (intagain==1) & (tottot==2 | tottot==3 | tottot==4 | tottot==5)	282
6	0	0	0	0 or 1	Female		(zbothwill==2 | (zbothwill==3 & (zpwtwill==1 | zpwtwill==2))) & (peers==1 | drunk==1 | smkcann==1 | othdrg==1) & (zrttime==1 | zrttime==2) & (rsex==2) & (agrp==1) & (intagain==1) & (tottot==2 | tottot==3 | tottot==4 | tottot==5)	80
7	0	1	1	0 or 1	Female		(zbothwill==2 | (zbothwill==3 & (zpwtwill==1 | zpwtwill==2))) & (peers==0 & drunk==0 & smkcann==0 & othdrg==0) & (zrttime==3) & (rsex==2) & (agrp==1) & (intagain==1) & (tottot==2 | tottot==3 | tottot==4 | tottot==5)	40

8	1	0	0	0 or 1	Female		(zbothwill==1) & (peers==1 | drunk==1 | smkcann==1 | othdrg==1) & (zrttime==1 | zrttime==2) & (rsex==2) & (agrp==1) & (intagain==1) & (tottot==2|tottot==3|tottot==4|tottot==5)	111
9	1	1	0	0 or 1	Male		(zbothwill==1) & (peers==0 & drunk==0 & smkcann==0 & othdrg==0) & (zrttime==1 | zrttime==2) & (rsex==1) & (agrp==1) & (intagain==1) & (tottot==2|tottot==3|tottot==4|tottot==5)	176
10	1	0	1	0 or 1	Male		(zbothwill==1) & (peers==1 | drunk==1 | smkcann==1 | othdrg==1) & (zrttime==3) & (rsex==1) & (agrp==1) & (intagain==1) & (tottot==2|tottot==3|tottot==4|tottot==5)	63
11	0	0	0	0 or 1	Male		(zbothwill==2 | (zbothwill==3 & (zpwtwill==1 | zpwtwill==2))) & (peers==1 | drunk==1 | smkcann==1 | othdrg==1) & (zrttime==1 | zrttime==2) & (rsex==1) & (agrp==1) & (intagain==1) & (tottot==2|tottot==3|tottot==4|tottot==5)	11
12	0	1	0	0 or 1	Male		(zbothwill==2 | (zbothwill==3 & (zpwtwill==1 | zpwtwill==2))) & (peers==0 & drunk==0 & smkcann==0 & othdrg==0) & (zrttime==1 | zrttime==2) & (rsex==1) & (agrp==1) & (intagain==1) & (tottot==2|tottot==3|tottot==4|tottot==5)	23

Table a1: Sub-sample of Natsal-3 respondents to be followed up for cognitive interviews ('fs' refers to first sex).

Additional factors that respondents will vary on: age at interview, age at first sex, geographical region.

Cognitive Interviews

This qualitative component will use cognitive interviewing methods in order to gather data on how young people formulate their answers to the questions show in Figure a1.

Concept	NATSAL-2010 Questions
Willingness of partners	<p>Q: Would you say you were both equally willing to have intercourse that first time, or was one of you more willing than the other?</p> <p>A:</p> <ol style="list-style-type: none"> 1. Both equally willing 2. Respondent more willing 3. Partner more willing
Regret	<p>Q: Looking back now to the first time you had sexual intercourse, do you think....</p> <p>A:</p> <ol style="list-style-type: none"> 1. You should have waited longer before having sex with anyone 2. That you shouldn't have waited so long 3. It was at about the right time
Autonomous reason	<p>Q: Which one of these applied to you at the time.... (choose the main one that applied at the time)</p> <p>A:</p> <ol style="list-style-type: none"> 1. I was curious about what it would be like 2. I was carried away by my feelings 3. Most people in my age group seemed to be doing it 4. It seemed like a natural 'follow on' in the relationship 5. I was a bit drunk at the time 6. I had smoked some cannabis 7. I had take some other drugs 8. I wanted to lose my virginity 9. I was in love 10. Can't choose/more than one main factor
Use of reliable method of contraception	<p>Q: Thinking of that first time you had sexual intercourse, did you or your partner use any form of contraception or take any precautions that first time, or not?</p> <p>A:</p> <ol style="list-style-type: none"> 1. Condom 2. The pill 3. Emergency contraception 4. Other contraception 5. (Partner) withdrew 6. Made sure it was a safe period 7. No precautions by me, don't know about partner 8. No precautions by either of us

Figure a1: The four Natsal-3 questions contributing to the measure of sexual competence, which will be further explored in interviews employing cognitive interviewing methodology.

Widely drawn upon in the cognitive interviewing literature is Tourangeau's (Tourangeau, 1984) (see Figure a2) four-stage cognitive model, which illustrates the hypothesised process which a respondent goes through when faced with a question; proponents of this model assert that each processing step must be successful if the resulting output is to be free of error.

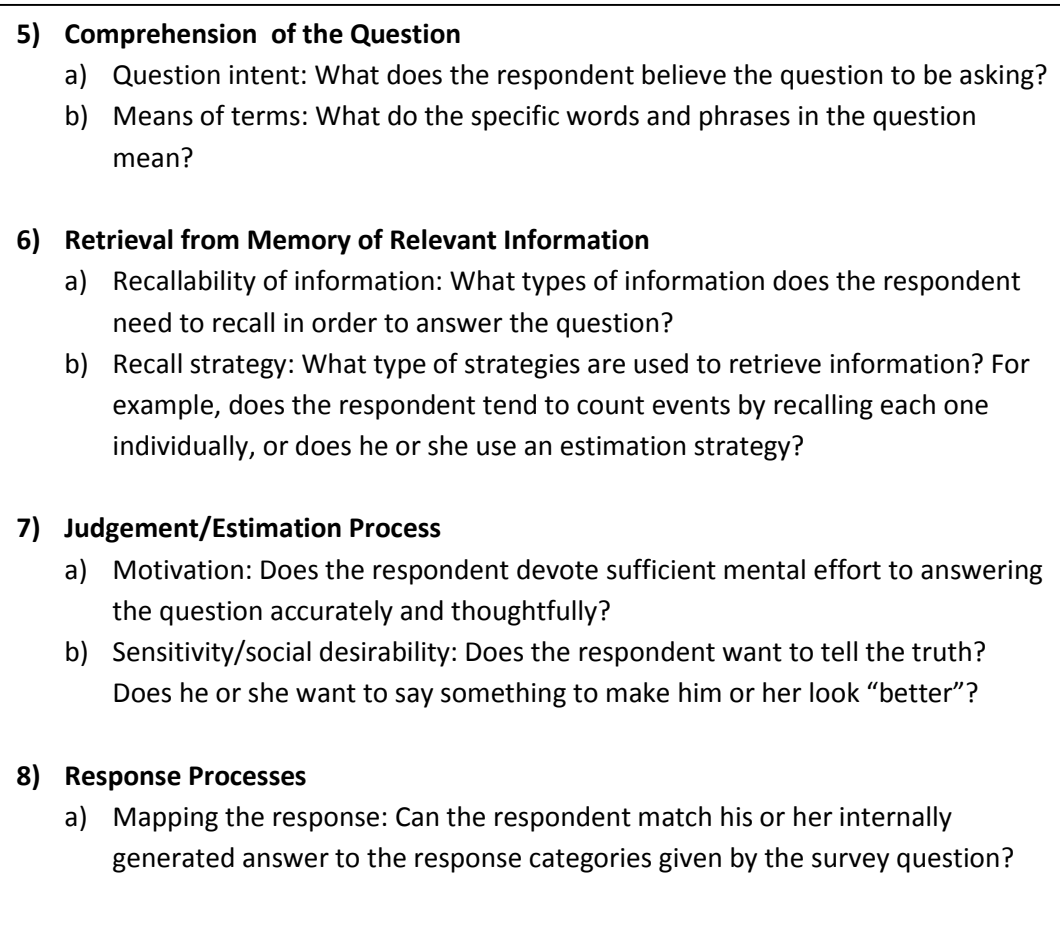


Figure a2: Tourangeau's (1984) four-stage cognitive model

The idea that an answer to a survey question can be "free of error" carries with it the assumption that the question has a one true distinct meaning which the researcher is trying to accurately communicate to the respondent. Such an assumption cannot be applied to each of four Natsal questions under study. Although the true meaning underlying the question regarding contraceptive use at first intercourse is relatively explicit, the same cannot be said for the remaining three questions.

Willingness

Willingness to have sexual intercourse is a complex concept both to define and measure. Research into sexual behaviour among young people highlights that decision-making regarding whether to have sex or not is not straightforward. The transition into sexual activity is sometimes characterised by a high degree of silence and ambiguity due to both uncertainty about what the self and partner wants and intends, and also as method of self-preservation; in not being explicit about one's intentions, one can avoid outright rejection. (Mitchell and Wellings, 2002). Where verbal communication is lacking, young people may depend on physical cues to inform them of their partner's desires and intentions (Coleman and Ingham, 1999). The aim for this piece of qualitative research is not to judge whether this question regarding willingness at first sex is subject to error, but to provide an insight into how respondents understand and respond to this question. Specifically, with reference to Tourangeau's four-stage cognitive model, this research component aims to elucidate:

1. Comprehension of the question

Question intent: What does the respondent believe the question to be asking?

Means of terms: What does the term 'willing' mean? How do respondents conceptualise 'equal willingness' and 'unequal willingness'?

2. Retrieval from memory of relevant information

Recallability of information: how does the respondent recall willingness at first sex? What factors are important to recall? Immediate contextual environment and interaction just before first sex occurred? Greater context of relationship with partner? Verbal/physical/any communication regarding sexual intentions? Determinants of recall e.g. interval since event and salience .

3. Judgement/Estimation Process

Motivation: Does the respondent devote sufficient mental effort to answering the question accurately and thoughtfully? How does the respondent judge their experiences to decide on the balance of willingness? What information is important in making this decision?

4. Response processes

Mapping the response: Can the respondent match his or her internally generated answer to the response categories given by the survey question? How does the respondent decide on the best matched predefined answer?

Regret

'Regret' is a post hoc label that has been applied to the meaning of a respondent giving the answer "should have waited longer before having sex with anyone". Whether feeling that one should have waited longer before having sex with anyone equates to regret is questionable. Again, the aim of this qualitative interview is to gain an understanding as to how respondents consider this question and how they go about formulating their response.

1. Comprehension of the question

Question intent: What does the respondent believe the question to be asking?

Means of terms: What does the term 'right time' mean? How do respondents conceptualise 'timing' with regard to first sex.

2. Retrieval from memory of relevant information

Recallability of information: how does the respondent recall timing of first sex? What is this timing in relation to – age? Relationship status? Partner? Life events? What factors are important to recall? Immediate contextual environment and interaction just before first sex occurred? Greater context of relationship with partner? Determinants of recall e.g. interval since event.

3. Judgement/Estimation Process

Motivation: Does the respondent devote sufficient mental effort to answering the question accurately and thoughtfully? How does the respondent judge their experiences whether the timing was 'right' or if they should have 'waited longer'? What information is important in making this decision?

4. Response processes

Mapping the response: Can the respondent match his or her internally generated answer to the response categories given by the survey question? How does the respondent decide on the best matched predefined answer?

Autonomy

This question asks whether certain circumstances applied at the time of first sex, and requires the respondents to select the 'main' one that applied. This seeks to measure the context of first sex and to make a judgement as to whether the autonomy of the respondent was maintained when first sexual intercourse occurred. Specifically, according to the present coding of the sexual competence measure, those that can be considered as reasons external to the self (friends doing it/ drunk/ drugs) are considered to indicate the decision to have sex was less than autonomous. If a respondent selected one of the options deemed to be internal to the self (curious about what it would be like/ carried away by my feelings/ seemed like a natural 'follow on' in the relationship/ I wanted to lose my virginity/ I was in love), the decision-making arena would be classified as autonomous.

Through the cognitive interview we hope to gain understanding about how respondents contemplate this question, how they go about formulating their response and whether they would classify their response in the same way that the researchers' would.

1. Comprehension of the question

Question intent: What does the respondent believe the question to be asking?

2. Retrieval from memory of relevant information

Recallability of information: how does the respondent recall the circumstances that applied at first sex? What factors are important to recall? Determinants of recall e.g. interval since event.

3. Judgement/Estimation Process

Motivation: Does the respondent devote sufficient mental effort to answering the question accurately and thoughtfully? How does the respondent judge their experiences to decide which was the main circumstance that applied? What information is important in making this decision?

4. Response processes

Mapping the response: Can the respondent match his or her internally generated answer to the response categories given by the survey question? How does the respondent decide on the best matched predefined answer? Does the respondent consider their answer to be reflective of their degree of autonomy at first sex?

Recruitment Letter for Cognitive Interviews



Dear

RE: Participation in Natsal Follow-up Study

You may remember being interviewed recently for the Natsal survey. We hope you enjoyed the experience and we would like to thank you for your contribution to this important national research.

At that time, you said that you would be willing for a member of the research team to contact you again. We are getting in touch because we'd like to invite you to take part in a small follow-up study to investigate how people decided on their answers to some of the questions in the previous study.

This time, the interview will involve a conversation with a trained researcher. We would like to find out more about how you came to decide on your answers to certain questions. The interview will focus on topics that are relevant to your personal experience.

I will call you in the next week or so, on the telephone number you provided, to ask if you will agree to take part. If you do, we can then arrange the interview for a time and place that suits you. The interviewer can come and talk to you at home or in another suitable location. There is no obligation to take part if you would prefer not to.

I would like to assure you that any information you give us will be treated in strict confidence and the results of the study will never include any personal details. The information collected is used for research purposes only. Your comments will be made anonymous and we will not use your name at any time, nor link the information you give us with you as an individual.

In our work we rely on people's voluntary co-operation. However, we find that most people enjoy the experience. As a thank you for your time, we will give you a £20 high street voucher.

Thank you again for your help so far.

Yours,

Consent Form for Cognitive Interviews (v.3)

National Survey of Sexual Attitudes and Lifestyles (Natsal-3) survey follow-up study

CONSENT FORM

Please read the following statements, initial those you agree with in the box on the right, and then sign your name at the end:

1.	I confirm that I have read the information sheet for the above study and have had the opportunity to ask questions.	
2.	I agree to take part in an interview.	
3.	I understand that all information I give during the interview will be strictly confidential.	
4.	I understand that the results of the study will be anonymised. This means that no one will be able to trace anything I say during the interview back to me.	
5.	I understand that anonymised, unidentifiable quotes of mine may be used in reports of the study.	
6.	I understand that my participation is voluntary and that I can stop the interview at any time without giving any reason.	
7.	I understand that anonymised information I give may be reviewed by the authorities responsible for regulating the study (the London School of Hygiene & Tropical Medicine and the National Centre for Social Research).	
Optional Consent		
8.	I agree to the interview being audio recorded.	
9.	I am willing for members of the Natsal research team to have access to my responses to the Natsal 3 survey.	

Name of participant	Signature	Date
Name of Chief Investigator	Signature	Date

If you would like more information, please
contact: Melissa Palmer
London School of Hygiene and Tropical Medicine
Keppel Street
London WC1E 7HT
Tel: 020 7299 4681
email: melissa.palmer@lshtm.ac.uk





LONDON
SCHOOL of
HYGIENE
& TROPICAL
MEDICINE



National Survey of Sexual Attitudes and Lifestyles (Natsal) follow-up: interview study about first sexual experiences

Study Information Sheet

We would like to thank you for your contribution to the Natsal survey which you completed some time ago. At that time, you said that you would be willing for a member of the research team to contact you again. We have now reached the next stage of the study and hope that you will take part again. Before you decide whether you would like to, please read this information so you know what the study is about and what taking part means for you.

What is the study about?

The Natsal survey involves 15,000 people from all over Britain. The results will allow us to look at changes in sexual and reproductive health since 2000 and therefore to plan health education and services that can respond to current needs. We are following up a smaller number of people to find out how respondents went about forming their answers to the questions relating to first sex experience that were asked in the survey, and this is what we would like your help with. The purpose of the interview is to have an in-depth discussion about how you recall and reflect on your first sexual experience, with reference to the questions that you were asked in the Natsal study about the circumstances of your first sexual experience.

Who is carrying out this study?

Researchers from the London School of Hygiene and Tropical Medicine (LSHTM), a University of London medical school (see www.lshtm.ac.uk). These researchers are part of the team who designed the Natsal survey you completed. This particular study is being conducted as part of wider PhD project.

Why have I been asked?

During the Natsal Survey you said that you would be willing to be contacted again and you fit in to the age range of people we would like to talk to again (16-24 year olds at the time of the Natsal interview). We would like to know more about how people remember and reflect on their first sexual experiences when forming their answers to certain Natsal survey questions. The interview will focus on topics that are relevant to your personal experience.

What does taking part involve?

We would like you to take part in a one-to-one interview with one of the research team. This would be at a time and place convenient for you and would last between an hour and an hour and a half. The interviewer would come to a location of convenience to you, either at your home or another private location, depending on what you would prefer. The interview will be different from the survey you took part in last time as we would like to discuss your views, opinions and experiences in greater detail. To allow us to link information from the survey with that from the interview, we would like your permission for members of the research team to have access to your responses to the Natsal 3 survey. With your permission, the interview would be audio recorded.

Do I have to take part?

You do not have to take part. Your contribution would be very valuable to us, but it is entirely up to you to decide whether you'd like to take part in this study. If you do take part, you don't have to answer all the questions and you can end the interview at any time.

What will happen to the information I give?

Everything you tell us will be strictly confidential. No one will be able to trace anything said in the interview back to you as an individual. Data and results from this study will not include any names or identifying information and will be stored securely in line with the research team's policies.

Personal data (names and contact details) will be kept separately from the audio recordings and written transcripts of the interviews. They will be password protected and stored on computer files which can be accessed only by the research team. Interview recordings and transcripts will also be password protected and stored securely on computers at LSHTM. When the findings of the study are published, quotes from the interview transcripts will be reported anonymously and some contextual details may be altered in direct quotes in order to preserve confidentiality.

This study has been reviewed and approved by the South Central – Oxford A Research Ethics Committee.

What's in it for me?

It's an opportunity to talk about your experiences and views to an attentive listener. At the same time you will be contributing to a national research study. As a thank you for your time, we will give you a £20 high street shopping voucher. We will reimburse any expenses associated with taking part.

If you have any questions or would like to know more, please contact:

Melissa Palmer
London School of Hygiene and Tropical Medicine
Keppel Street
London WC1E 7HT
phone: 020 7299 4700
e-mail: melissa.palmer@lshtm.ac.uk

Script for telephone call

Telephone Script

Introduction

- Greeting and check that talking to the potential participant.
- Check that letter of recruitment was received.
- Explain reasons for and process of follow-up of NATSAL respondents for further interview.
- Say: 'You have been selected for interview because you said you would be willing to be contacted again by the research team and based on your responses to some of the Natsal questions.'

Interview content

- Say 'Like the Natsal questionnaire you completed, this interview will be about your experiences of sex and views on sexual matters. Some of the questions are of a personal nature.'
- Explain content of interview.
- Questions will focus on: First experience of sex.

Interview arrangements

Explain the following:

- confidentiality of responses
- anonymity in reporting of findings
- no obligation to answer any particular question
- The interview can end at any time if you do not want to continue

Give details of voucher.

Say: 'Have you any questions about the interview?'

If so, respond to question(s).

Say: 'Would you like to take part?'

If willing, agree date, time and venue and explain that you will write to confirm appointment.

Ensure that you have correct contact details.

Explain that participant can change his/her mind at any time about taking part without giving an explanation.

If unwilling, thank respondent and end call.

Introduction to interview

Rationale

"To explain why I'm here. You remember that you were interviewed a while ago on health topics, including sexual lifestyles, attitudes and experiences. The answers you gave in that survey will be very useful to gain an idea of how many, and what proportion of, people in the population think and behave in particular ways, and have had particular experiences. But that will give a picture drawn in numbers, and we would also like to get a sense of people's experiences in their own words. So we're returning to a small selection of people who were willing to be re-interviewed to get their accounts of their experiences and accounts of how they remember and reflect on these experiences when answering the Natsal survey questions. You'll find the questions I ask today more open than those you answered in the survey, and it's for you to fill in the detail".

Confidentiality

E.g. "You helped a lot by agreeing to be interviewed again, and this time we've got a voucher to give you to say thank you for your time. I'll be asking you to tell me all about yourself, but you don't need to worry about anyone finding out what you've said. Nothing you tell me will be linked up with your personal details, we just call you a number after today! But if you don't want to answer a question just say so."

Appendix 3: Letters of ethical approval

London School of Hygiene & Tropical Medicine
Keppel Street, London WC1E 7HT
United Kingdom
Switchboard: +44 (0)20 7636 8636
www.lshtm.ac.uk



Observational / Interventions Research Ethics Committee

Melissa Palmer
Research Student
Population Studies Department/ EPH
LSHTM

3 December 2012

Dear Ms Palmer,

Study Title: 'Sexual Competence': a critical assessment of a public health concept
LSHTM ethics ref: 6309

Thank you for your letter of 23 November 2012, responding to the Observational Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Conditions of the favourable opinion

Approval is dependent on local ethical approval having been received, where relevant.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
LSHTM ethics application	n/a	
Protocol		
Information Sheet		
Consent form		
Recruitment letter	V2	23/11/2012

After ethical review

Any subsequent changes to the application must be submitted to the Committee via an E2 amendment form. All studies are also required to notify the ethics committee of any serious adverse events which occur during the project via form E4. At the end of the study, please notify the committee via form E5.

Yours sincerely,

A handwritten signature in blue ink, appearing to read 'Andrew J Hall'.

Professor Andrew J Hall
Chair
ethics@lshtm.ac.uk
<http://intra.lshtm.ac.uk/management/committees/ethics/>

NRES Committee South Central - Oxford A

Bristol Research Ethics Committee Centre
Whitefriars
Level 3 Block B
Lewins Mead
Bristol
BS1 2NT

Telephone: 0117 342 1331
Facsimile: 0117 342 0445

25 March 2013

Miss Melissa J Palmer
London School of Hygiene and Tropical Medicine
Keppel Street
London
WC1E 7HT

Dear Miss Palmer

Study title:	A qualitative study exploring how Natsal-3 (the third National Survey of Sexual Attitudes and Lifestyles) respondents formulated their answers to questions about their experience of first sex
REC reference:	13/SC/0002
Protocol number:	N/A
IRAS project ID:	119017

Thank you for your letter of 19 March 2013, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Conditions of the favourable opinion

Appendix 4: Comparing different strategies for coding ALSPAC sexual competence items

UNEQUAL WILLINGNESS % (95% CI)				
	NATSAL	ALSPAC: WILL1	ALSPAC: WILL2	
	11.1% (9.5-13.6)	FS:11.5% (8.7-14.4) SS:10.1% (7.2-13.0)	FS:4.9% (3.0-6.9) SS: 5.6% (3.4-7.8)	
NO AUTONOMOUS REASON % (95% CI)				
	NATSAL	ALSPAC: REASON1	ALSPAC: REASON2	ALSPAC: REASON3
	15.5% (13.6-17.5)	FS:4.3% (2.5-6.1) SS: 5.0% (2.9-7.0)	FS:6.6% (4.4-8.9) SS: 7.5% (5.0-10.0)	FS:8.0% (5.6-10.4) SS: 10.6% (7.6-13.5)
REGRET % (95% CI)				
	NATSAL	ALSPAC: REGRET1		
	32.4% (29.8-70.2)	FS:14.8% (11.6-18.0) SS: 13.1% (9.9-16.4)		
NO CONTRACEPTION % (95% CI)				
	NATSAL	ALSPAC: CONTRA1		
	8.0% (6.6-9.5)	FS:9.1% (6.5-11.6) SS: 13.1% (9.9-16.4)		

Table a2: Comparison of prevalence of characteristics of sexual debut comparing ALSPAC and NATSAL, and within ALSPAC, FIRST SEX and SUBSEQUENT SEX

Natsal-3 participants who were 16-24 at interview, 15 or 16 at first sex (MALES and FEMALES)

Need to make binary indicators of each competence component: regret=0/1; autonomous decision=0/1; partner willingness=0/1; contraceptive protection=0/1.

PARTNER WILLINGNESS	
1.	Q: Did you both know this [sexual intercourse] was going to happen? fh9102
A:	
1.	Yes
2.	No
2.	Q: Did you want to do it? fh9103
A:	
1.	Yes
2.	No
3.	Q: Did they make you do it? fh9104
A:	
1.	Yes
2.	No

Partner willingness:

Version 1 : **includes BOTH KNEW IT WOULD HAPPEN

gen will1=0

replace will1=1 if (fh9102==1 & fh9103==1 & fh9104==2)

replace will1=0 if (fh9102==2 | fh9103==2 | fh9104==1)

replace will1=. if (fh9102==. & fh9103==. & fh9104==.)

Version 2 : **Regardless of KNEW OR NOT

gen will2=0

replace will2=1 if ((fh9102==1 | fh9102==2) & (fh9103==1 & fh9104==2))

replace will2=0 if (fh9103==2 | fh9104==1)

replace will2=. if (fh9103==. & fh9104==.)

REGRET

4. Q: How much do you regret having sex intercourse? fh9123

A:

1. Not at all
2. A bit
3. Quite a lot
4. Very much

Regret

Version 1 :

gen regret1=0

replace regret1= 1 if (fh9123==1)

replace regret1=0 if fh9123==2 | fh9123==3 | fh9123==4

replace regret1=. if fh9123==.

AUTONOMOUS DECISION

5. Q: Why did you have sexual intercourse? (1=yes 2=no) ***THIS IS TICK ALL THAT APPLY

A:

1. So they wouldn't dump me fh9116
2. I want to lose my virginity fh9117
3. We were going out together and it seemed natural fh9118
4. I wanted to know what it was like fh9119

5. I love this person **fh9120**
6. My friends do it **fh9121**
7. I got carried away **fh9122**

6. Q: The last time you did this, had you been drinking alcohol before it happened? **fh9106**

A:

1. Yes
2. No

7. Q: After drinking alcohol were you.... **fh9107**

A:

1. Not tipsy at all
2. A bit tipsy
3. Quite tipsy
4. Very tipsy
5. Drunk

8. Q: The last time you did this, had you been using drugs before it happened? **fh9108**

A:

1. Yes
2. No

Version 1 : **just based on REASON

```
gen reason1=0
replace reason1=1 if fh9116==2 | fh9121==2
replace reason1=0 if fh9116==1 | fh9121==1
replace reason1=. if fh9116==. & fh9121==.
```

Version 2 : **based on REASON and ALCOHOL

```
gen reason2=0
replace reason2=1 if ((fh9116==2 | fh9121==2) | (fh9106==2 | fh9107==1 | fh9107==2 |
fh9107==3 | fh9107==4))
replace reason2=0 if ((fh9116==1 | fh9121==1) | (fh9106==1 & fh9107==5))
replace reason2=. if (fh9116==. & fh9121==. & fh9106==.)
```

Version 3 : **based on REASON and ALCOHOL and DRUGS

```
gen reason3=0
replace reason3=1 if (((fh9116==2 | fh9121==2) | (fh9106==2 | fh9107==1 | fh9107==2 |
fh9107==3 | fh9107==4) | (fh9108==2)))
replace reason3=0 if ((fh9116==1 | fh9121==1) | (fh9106==1 & fh9107==5)) | (fh9108==1)
replace reason3=. if (fh9116==. & fh9121==. & fh9106==. & fh9108==.)
```


CONTRACEPTIVE PROTECTION

9. Q: Did you use a condom? **fh9109**

A:

1. Yes
2. No

10. Q: Did you use any other type of contraceptive? **fh9110**

A:

1. Yes
2. No

11. Q: What other type of contraceptive did you use? **fh9111**

A:

1. Withdrawal
2. The pill
3. The morning-after pill
4. Something else

Version 1 : **used CONDOM or PILL

gen contra1=0

replace contra1=1 if fh9109==1 | fh9111==2

replace contra1=0 if (fh9109==2 & (fh9110==2|fh9111==1|fh9111==3|fh9111==4))

replace contra1=. if (fh9109==. & fh9110==.)

Appendix 5: Antecedent variables associated with sexual competence –

adding the contextual variables relating to first sex one by one to identify which causes the loss of significant association between learning about sex variables and sexual competence

WOMEN: outcome - sexual non-competence	a			b			c		
	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
IMD quintile									
1: least deprived	1	.	.	1	.	.	1	.	.
2	1.11	0.75,1.63	0.601	1.15	0.80,1.66	0.448	1.17	0.81,1.68	0.414
3	0.89	0.60,1.31	0.543	0.89	0.62,1.30	0.555	0.93	0.65,1.35	0.718
4	1.46	1.01,2.12	0.044	1.39	0.97,1.98	0.073	1.45	1.01,2.07	0.041
5: most deprived	1.2	0.82,1.75	0.354	1.17	0.81,1.71	0.404	1.25	0.87,1.81	0.225
Parental SES									
No response	1.04	0.68,1.61	0.847	0.94	0.62,1.44	0.785	1.01	0.66,1.54	0.963
Parents iv/v manual	1.58	1.10,2.25	0.012	1.38	0.98,1.93	0.061	1.29	0.93,1.80	0.131
Parents i/ii/iii non-manual	1	.	.	1	.	.	1	.	.
Education level of respondent									
Left school at 16 with no qualifications	2.52	1.27,4.99	0.008	2.78	1.47,5.26	0.002	2.68	1.43,5.01	0.002
Left school at 16 with qualifications	1.28	0.91,1.79	0.158	1.25	0.91,1.71	0.173	1.28	0.94,1.75	0.121
Left school at 17+	1	.	.	1	.	.	1	.	.
Currently 16	0.53	0.32,0.87	0.013	0.55	0.33,0.92	0.022	0.55	0.34,0.89	0.016
Ethnic Group									
White	1	.	.	1	.	.	1	.	.
Mixed	1.5	0.76,2.97	0.239	1.75	0.85,3.61	0.129	1.81	0.90,3.65	0.096
Asian	2.02	0.79,5.18	0.145	1.33	0.59,2.97	0.493	1.23	0.58,2.61	0.594
Black	5.61	2.00,15.74	0.001	4.04	1.68,9.69	0.002	3.67	1.53,8.81	0.004
Chinese and 'other'	2.73	0.77,9.67	0.119	2.37	0.81,6.88	0.114	1.69	0.59,4.79	0.326
Family Structure									
Both parents									
One parent	1.12	0.86,1.47	0.396	1.22	0.94,1.60	0.137	1.26	0.97,1.64	0.081
Main Source of Sex Education									
Mother or Father	1.22	0.80,1.84	0.352	1.33	0.88,2.00	0.175	1.31	0.88,1.94	0.183
Lessons at School	1	.	.	1	.	.	1	.	.
Friends	1.27	0.93,1.74	0.129	1.37	1.02,1.85	0.038	1.47	1.10,1.98	0.01
Other	1.12	0.79,1.57	0.535	1.18	0.85,1.64	0.311	1.22	0.89,1.68	0.217
Ease discussing sex with parents at 14									
Easy with one/both	1	.	.	1	.	.	1	.	.
Difficult	1.35	0.84,2.18	0.215	1.63	0.99,2.68	0.056	1.61	0.99,2.64	0.057
Didn't discuss with either	1.32	0.96,1.81	0.088	1.4	1.03,1.90	0.031	1.4	1.04,1.89	0.026
Varied depending on topic	0.8	0.41,1.56	0.518	0.74	0.41,1.34	0.317	0.8	0.43,1.47	0.468
Sex before age 16									
No									
Yes	2.68	2.05,3.51	<0.001	2.97	2.28,3.87	<0.001	2.59	2.00,3.36	<0.001
Relationship with first sexual partner									
Just/recently met for first time	5.65	3.31,9.63	<0.001						
Known each other a while, not in steady relationship	4.22	3.07,5.81	<0.001						
Used to be in steady relationship	2.32	1.12,4.79	0.023						
Steady relationship	1	.	.						
Married/living together	0.13	0.02,1.06	0.056						
Partner's first time too									
Yes, partner's first time				1	.	.			
Think it was first time				3.2	1.53,6.68	0.002			
Think it was not first time				3.38	1.92,5.92	<0.001			
No, not first time				1.91	1.47,2.48	<0.001			
Age difference between respondent and first sex partner									

Partner younger than respondent			1.48	0.76,2.87	0.250
Same age			1	.	.
Respondent younger than partner			1.31	1.03,1.67	0.026

Appendix 6: Regression analyses - antecedent factors associated with sexual competence using categorical age at first sex variable

WOMEN: outcome – sexual non-competence						
	AOR	95% CI	p-value	AOR	95% CI	p-value
IMD quintile						
1: least deprived	1	.	.	1	.	.
2	1.16	0.81,1.67	0.42	1.12	0.76,1.66	0.566
3	0.93	0.64,1.36	0.718	0.86	0.57,1.28	0.449
4	1.41	0.98,2.01	0.063	1.39	0.95,2.02	0.091
5: most deprived	1.26	0.87,1.82	0.216	1.15	0.78,1.70	0.473
Parental SES						
No response	1.02	0.66,1.57	0.946	1.00	0.64,1.58	0.988
Parents iv/v manual	1.23	0.88,1.71	0.231	1.50	1.05,2.14	0.027
Parents i/ii/iii non-manual	1	.	.	1	.	.
Education level of respondent						
Left school at 16 with no qualifications	2.68	1.44,4.99	0.002	2.51	1.26,5.02	0.009
Left school at 16 with qualifications	1.16	0.84,1.60	0.358	1.1	0.78,1.56	0.590
Left school at 17+	1	.	.	1	.	.
Currently 16	0.53	0.32,0.86	0.010	0.5	0.30,0.85	0.010
Ethnic Group						
White	1	.	.	1	.	.
Mixed	1.71	0.88,3.32	0.114	1.46	0.75,2.84	0.264
Asian	1.49	0.71,3.15	0.294	2.48	0.99,6.22	0.053
Black	4.50	1.70,11.89	0.002	6.46	1.94,21.52	0.002
Chinese and 'other'	2.13	0.74,6.14	0.162	4.12	1.04,16.42	0.044
Family Structure						
Both parents						
One parent	1.22	0.94,1.60	0.138	1.08	0.81,1.42	0.605
Main Source of Sex Education						
Mother or Father	1.29	0.87,1.91	0.205	1.24	0.81,1.87	0.319
Lessons at School	1	.	.	1	.	.
Friends	1.46	1.08,1.96	0.014	1.24	0.90,1.71	0.187
Other	1.18	0.85,1.63	0.313	1.08	0.76,1.53	0.678
Ease discussing sex with parents at 14						
Easy with one/both	1	.	.	1	.	.
Difficult	1.56	0.94,2.57	0.084	1.4	0.85,2.31	0.192
Didn't discuss with either	1.46	1.08,1.96	0.013	1.37	1.00,1.89	0.053
Varied depending on topic	0.79	0.43,1.46	0.447	0.73	0.38,1.42	0.354
Categorical age at first sex						
13-14	1	.	.	1	.	.
15	0.46	0.31,0.69	<0.001	0.48	0.31,0.74	0.001
16	0.24	0.16,0.37	<0.001	0.23	0.15,0.37	<0.001
17	0.27	0.17,0.43	<0.001	0.25	0.15,0.41	<0.001
18-24	0.15	0.09,0.24	<0.001	0.12	0.06,0.21	<0.001
Relationship with first sexual partner						
Just/recently met for first time				5.38	3.14,9.22	<0.001
Known each other a while, not in steady relationship				3.89	2.80,5.40	<0.001
Used to be in steady relationship				2.34	1.15,4.76	0.020
Steady relationship				1	.	.
Married/living together				0.21	0.03,1.74	0.148
Partner's first time too						
Yes, partner's first time				1	.	.
Think it was first time				2.98	1.38,6.45	0.006
Think it was not first time				2.49	1.34,4.63	0.004
No, not first time				1.53	1.14,2.05	0.004
Age difference between respondent and first sex partner						
Partner younger than respondent				1.69	0.83,3.42	0.145
Same age				1	.	.
Respondent younger than partner				1.01	0.77,1.33	0.947

MEN: outcome – sexual non-competence	AOR	95% CI	p-value	AOR	95% CI	p-value
IMD quintile						
1: least deprived	1	.	.	1	.	.
2	1.45	0.94,2.24	0.090	1.41	0.91,2.17	0.120
3	1.67	1.08,2.58	0.021	1.63	1.06,2.52	0.027
4	2.26	1.42,3.60	0.001	2.15	1.37,3.37	0.001
5: most deprived	2.08	1.34,3.24	0.001	1.92	1.22,3.02	0.005
Parental SES						
No response	1.74	1.10,2.76	0.018	1.79	1.13,2.83	0.014
Parents iv/v manual	1.64	1.13,2.38	0.009	1.57	1.08,2.29	0.019
Parents i/ii/iii non-manual	1	.	.	1	.	.
Education level of respondent						
Left school at 16 with no qualifications	1.32	0.67,2.59	0.421	1.27	0.62,2.57	0.511
Left school at 16 with qualifications	1.07	0.74,1.55	0.726	1.06	0.73,1.54	0.769
Left school at 17+	1	.	.	1	.	.
Currently 16	0.92	0.55,1.55	0.757	0.93	0.54,1.59	0.794
Ethnic Group						
White	1	.	.	1	.	.
Mixed	3.23	1.43,7.32	0.005	3.31	1.40,7.79	0.006
Asian	1.21	0.57,2.54	0.617	1.45	0.68,3.09	0.341
Black	0.78	0.34,1.76	0.545	0.78	0.33,1.84	0.571
Chinese and 'other'	2.14	0.58,7.87	0.250	2.13	0.57,7.90	0.259
Family Structure						
Both parents						
One parent	0.97	0.70,1.33	0.835	0.99	0.72,1.35	0.929
Main Source of Sex Education						
Mother or Father	1.10	0.61,1.99	0.761	1.02	0.57,1.83	0.945
Lessons at School	1	.	.	1	.	.
Friends	0.99	0.70,1.39	0.94	0.91	0.64,1.29	0.586
Other	0.91	0.64,1.28	0.584	0.9	0.64,1.28	0.569
Ease discussing sex with parents at 14						
Easy with one/both	1	.	.	1	.	.
Difficult	1.65	0.89,3.05	0.114	1.66	0.90,3.06	0.105
Didn't discuss with either	0.91	0.63,1.30	0.587	0.87	0.61,1.24	0.435
Varied depending on topic	0.62	0.29,1.30	0.204	0.59	0.29,1.22	0.157
Categorical age at first sex						
13-14	1	.	.	1	.	.
15	0.53	0.35,0.81	0.003	0.6	0.39,0.92	0.020
16	0.29	0.19,0.44	<0.001	0.33	0.21,0.51	<0.001
17	0.37	0.23,0.61	<0.001	0.41	0.25,0.70	0.001
18-24	0.39	0.23,0.66	<0.001	0.38	0.22,0.68	0.001
Relationship with first sexual partner						
Just/recently met for first time				2.36	1.55,3.58	<0.001
Known each other a while, not in steady relationship				1.28	0.92,1.79	0.139
Used to be in steady relationship				2.08	0.99,4.37	0.052
Steady relationship				1	.	.
Married/living together				.	.	.
Partner's first time too						
Yes, partner's first time				1.69	0.86,3.34	0.130
Think it was first time				2	1.12,3.57	0.019
Think it was not first time				1.21	0.87,1.68	0.259
No, not first time						
Age difference between respondent and first sex partner						
Partner younger than respondent				0.94	0.60,1.48	0.793
Same age				1	.	.
Respondent younger than partner				1.32	0.92,1.88	0.128

Appendix 7: Multivariable logistic regression analysis – sexual competence
associated with sexual health indicators among 18-24s

WOMEN (18-24)	Crude OR	95% CI	p- value	AOR1	95% CI	p- value	AOR2	95% CI	p- value	AOR3	95% CI	p- value	AOR4	95% CI	p- value
EVER HAD AN STI															
Sexual competence competent	1			1			1			1			1		
non-competent	1.91	1.41,2.58	<0.001	1.66	1.20,2.30	0.002	1.51	1.09,2.10	0.013	1.47	1.05,2.05	0.023	1.44	1.04,2.00	0.030
Age at first sex first sex ≥16	1			1			1			1			1		
first sex ≤15	2.04	1.50,2.76	<0.001	1.78	1.29,2.45	<0.001	1.68	1.22,2.32	0.002	1.62	1.17,2.25	0.004	1.17	0.81,1.68	0.399
URINE-TEST HPV POSITIVE															
Sexual competence competent	1			1			1			1			1		
non-competent	1.51	1.08,2.11	0.015	1.38	0.97,1.95	0.072	1.47	1.02,2.11	0.039	1.47	1.02,2.12	0.037	1.46	1.02,2.10	0.041
Age at first sex first sex ≥16	1			1			1			1			1		
first sex ≤15	1.58	1.15,2.18	0.005	1.47	1.06,2.04	0.022	1.34	0.96,1.89	0.087	1.33	0.95,1.87	0.097	1.22	0.84,1.76	0.292
LOWER SEXUAL FUNCTION															
Sexual competence competent	1			1			1			1			1		
non-competent	2.02	1.38,2.94	<0.001	1.95	1.30,2.91	0.001	1.98	1.30,3.00	0.001	1.93	1.26,2.95	0.003	1.96	1.28,3.00	0.002
Age at first sex first sex ≥16	1			1			1			1			1		
first sex ≤15	1.19	0.83,1.70	0.349	1.03	0.70,1.52	0.863	1.08	0.73,1.59	0.697	1.09	0.74,1.62	0.664	1.09	0.71,1.68	0.698
UNPLANNED PREGNANCY															
Sexual competence competent	1			1			1			1			1		
non-competent	2.48	1.19,5.19	0.016	2.17	0.98,4.80	0.056	2.17	0.96,4.91	0.064	2.23	0.99,5.06	0.054	2.27	0.98,5.24	0.055
Age at first sex first sex ≥16	1			1			1			1			1		
first sex ≤15	3.11	1.51,6.38	0.002	2.62	1.23,5.57	0.012	2.57	1.19,5.53	0.016	2.59	1.19,5.61	0.016	2.78	1.20,6.44	0.017
NON-VOLITIONAL SEX															
Sexual competence competent	1			1			1			1			1		

non-competent	3.46	2.02,5.94	<0.001	2.89	1.61,5.20	<0.001	3.09	1.72,5.53	<0.001	2.99	1.64,5.45	<0.001	2.96	1.63,5.36	<0.001
Age at first sex															
first sex ≥16	1			1			1			1			1		
first sex ≤15	3.67	2.26,5.96	<0.001	3.13	1.85,5.28	<0.001	3.76	2.18,6.48	<0.001	3.66	2.13,6.30	<0.001	3.25	1.88,5.61	<0.001

Results of logistic regression analyses assessing association with: reported diagnosis of an STI ever, testing positive for HPV at interview, low sexual function in year prior to interview, unplanned pregnancy in year prior to interview, and reporting non-volitional sex ever (Women: 18-24)

AOR1: Mutually adjusted for sexual competence and sex before 16

AOR2: Same as AOR1 and adjusted for: IMD quintile of residence at interview, educational level of respondent, parental social class, family structure at age 14, ethnicity

AOR3: Same as AOR2 and adjusted for: ease discussing sexual matters with their parent(s) at age 14, their main source of sex education

AOR4: Same as AOR3 and adjusted for: duration sexually active

Results of logistic regression analyses assessing association with: reported diagnosis of an STI ever, testing positive for HPV at interview, and low sexual function in year prior to interview (Men: 18-24)

MEN (18-24)	Crude OR	95% CI	p- value	AOR1	95% CI	p- value	AOR2	95% CI	p- value	AOR3	95% CI	p- value	AOR4	95% CI	p- value
EVER HAD AN STI															
Sexual competence competent	1			1			1			1			1		
non-competent	1.4	0.88,2.22	0.157	1.09	0.68,1.76	0.709	1.11	0.68,1.81	0.690	1.12	0.69,1.82	0.644	1.11	0.69,1.80	0.669
Age at first sex first sex ≥16	1			1			1			1			1		
first sex ≤15	2.55	1.62,4.01	<0.001	2.33	1.46,3.73	<0.001	2.19	1.32,3.63	0.002	2.17	1.30,3.62	0.003	1.51	0.88,2.59	0.133
URINE-TEST HPV POSITIVE															
Sexual competence competent	1			1			1			1			1		
non-competent	1.77	1.11,2.82	0.016	1.67	1.02,2.76	0.043	1.87	1.09,3.21	0.024	1.84	1.08,3.14	0.026	1.92	1.11,3.32	0.019
Age at first sex first sex ≥16	1			1			1			1			1		
first sex ≤15	2.14	1.33,3.45	0.002	1.67	1.02,2.76	0.043	1.5	0.90,2.51	0.12	1.44	0.87,2.39	0.159	1.08	0.64,1.83	0.764
LOWER SEXUAL FUNCTION															
Sexual competence competent	1			1			1			1			1		
non-competent	1.45	0.99,2.13	0.059	1.41	0.94,2.12	0.096	1.4	0.93,2.11	0.103	1.41	0.94,2.11	0.093	1.43	0.96,2.15	0.081
Age at first sex first sex ≥16	1			1			1			1			1		
first sex ≤15	0.92	0.62,1.37	0.673	0.78	0.51,1.20	0.262	0.82	0.53,1.27	0.367	0.81	0.52,1.27	0.356	0.74	0.45,1.21	0.227

AOR1: Mutually adjusted for sexual competence and sex before 16

AOR2: Same as AOR1 and adjusted for: IMD quintile of residence at interview, educational level of respondent, parental social class, family structure at age 14, ethnicity

AOR3: Same as AOR2 and adjusted for: ease discussing sexual matters with their parent(s) at age 14, their main source of sex education

AOR4: Same as AOR3 and adjusted for: duration sexually active

Appendix 8: Multivariable logistic regression – outcomes associated with sexual competence at first sex. More parsimonious models including only covariates associated with exposure and outcome at p<0.2-0.3

More parsimonious multivariable logistic regression analyses, outcome: Self-reported STI (16-24s)

Self-reported STI	Women (1630/907.29)			Men (1301/954.99)		
	AOR	95% CI	p-value	AOR	95% CI	p-value
Competence						
competent	1			1		
non-competent	1.46	1.06,2.00	0.020	1.19	0.75,1.89	0.455
Age at first sex						
first sex ≥16	1			1		
first sex ≤15	1.07	0.76,1.51	0.701	1.25	0.76,2.06	0.388
IMD quintile						
1: least deprived	1	.	.	1	.	.
2	0.99	0.58,1.69	0.962	1.42	0.68,2.94	0.349
3	1.22	0.75,2.01	0.423	1.36	0.61,3.02	0.451
4	1.08	0.66,1.77	0.758	1.18	0.54,2.59	0.680
5: most deprived	1.05	0.64,1.71	0.854	1.38	0.65,2.95	0.403
Educational level						
Left school at 16 no qualifications	1.36	0.80,2.31	0.263	1.04	0.39,2.79	0.936
Left school at 16 with qualifications	1.15	0.79,1.68	0.462	1.38	0.82,2.32	0.226
Left school 17+ with qualifications	1	.	.	1	.	.
Currently 16	0.62	0.18,2.18	0.456	1.11	0.17,7.18	0.913
Ethnic Group						
White	1	.	.	1	.	.
Mixed	1.47	0.69,3.14	0.324	0.76	0.22,2.71	0.677
Asian, Chinese, Other	0.47	0.14,1.59	0.223	1.39	0.53,3.68	0.503
Black	3.61	1.62,8.07	0.002	2.42	0.71,8.27	0.158
Family Structure at 14						
Lived with both parents until 14	1			1		
One or neither parent	1.10	0.81,1.50	0.546	0.81	0.51,1.31	0.393
Main source of sex education						
Parents	0.85	0.54,1.33	0.474	1.11	0.45,2.76	0.818
School	1	.	.	1	.	.
Friends	1.37	0.95,1.99	0.095	1.66	0.94,2.93	0.081
Other	1.45	0.98,2.16	0.063	1.09	0.60,1.99	0.768
Duration sexually active						
0,1	1	.	.	1	.	.
2,3	5.25	2.15,12.79	<0.001	3.58	0.78,16.34	0.100
4, 5 yrs	8.80	3.64,21.27	<0.001	5.99	1.28,28.06	0.023
6,7	17.06	7.20,40.45	<0.001	8.02	1.68,38.42	0.009
8,11	19.66	7.79,49.64	<0.001	17.89	3.68,86.98	<0.001

More parsimonious multivariable logistic regression analyses, outcome: test positive for HPV (16-24s)

HPV	Women (888/532.30)			Men (717/532.40)		
	AOR	95% CI	p-value	AOR	95% CI	p-value
Competence						
competent	1			1		
non-competent	1.58	1.14,2.18	0.006	1.71	1.02,2.86	0.042
Age at first sex						
first sex ≥16	1			1		
first sex ≤15	1.18	0.85,1.64	0.329	1.25	0.75,2.06	0.393
IMD quintile						
1: least deprived	1	.	.	1	.	.
2	0.69	0.42,1.14	0.145	0.94	0.43,2.07	0.882
3	0.86	0.52,1.43	0.567	0.97	0.45,2.12	0.945
4	0.65	0.39,1.10	0.112	1.56	0.73,3.35	0.252
5: most deprived	0.72	0.43,1.21	0.221	1.11	0.50,2.47	0.801
Educational level						
Left school at 16 no qualifications	0.67	0.33,1.36	0.270	0.35	0.10,1.19	0.092
Left school at 16 with qualifications	0.92	0.58,1.46	0.717	1.22	0.71,2.10	0.463
Left school 17+ with qualifications	1	.	.	1	.	.
Currently 16	0.74	0.35,1.55	0.419	0.65	0.16,2.73	0.557
Ethnic Group						
White	1	.	.	1	.	.
Mixed	1.45	0.59,3.54	0.416	0.57	0.12,2.80	0.49
Asian, Chinese, Other	0.34	0.13,0.85	0.021	0.31	0.07,1.42	0.132
Black	0.82	0.37,1.83	0.625	0.23	0.03,2.00	0.181
Family Structure at 14						
Lived with both parents until 14	1			1		
One or neither parent	1.07	0.77,1.48	0.680	1.16	0.70,1.93	0.554
Ease discussing sex with parents at age 14						
Easy with one/both	1	.	.	1	.	.
Difficult	0.92	0.53,1.60	0.763	0.39	0.14,1.09	0.073
Didn't discuss with either	0.90	0.65,1.25	0.526	0.54	0.31,0.93	0.025
Varied depending on topic	0.98	0.40,2.44	0.969	.	.	.
Duration sexually active						
0,1	1	.	.	1	.	.
2,3	1.48	0.85,2.58	0.165	2.37	0.81,6.94	0.116
4, 5 yrs	1.50	0.83,2.71	0.181	2.31	0.77,6.95	0.135
6,7	2.05	1.14,3.67	0.016	5.49	1.89,15.93	0.002
8,11	1.74	0.89,3.39	0.105	4.93	1.57,15.51	0.006

More parsimonious multivariable logistic regression analyses, outcome: low sexual functioning (16-24s)

Low sexual functioning	Women (1548/865.52)			Men (1209/891.83)		
	AOR	95% CI	p-value	AOR	95% CI	p-value
Competence						
competent	1			1		
non-competent	1.93	1.31,2.84	0.001	1.44	0.99,2.09	0.055
Age at first sex						
first sex ≥16	1			1		
first sex ≤15	0.90	0.61,1.33	0.599	0.78	0.53,1.17	0.232
Ethnic Group						
White	1	.	.	1	.	.
Mixed	2.06	0.91,4.69	0.085	0.99	0.31,3.23	0.993
Asian, Chinese, Other	1.88	0.80,4.42	0.148	1.6	0.69,3.73	0.271
Black	0.92	0.26,3.20	0.890	1.34	0.43,4.17	0.612
Main source of sex education						
Parents	1.19	0.68,2.09	0.536	1.69	0.79,3.65	0.179
School	1	.	.	1	.	.
Friends	1.12	0.74,1.70	0.593	1.47	0.92,2.36	0.110
Other	0.98	0.58,1.66	0.937	1.11	0.69,1.78	0.663
Ease discussing sex with parents at age 14						
Easy with one/both	1	.	.	1	.	.
Difficult	1.24	0.62,2.45	0.543	1.49	0.64,3.44	0.352
Didn't discuss with either	1.14	0.74,1.76	0.555	1.77	1.09,2.88	0.022
Varied depending on topic	0.50	0.17,1.45	0.204	0.53	0.11,2.62	0.440
Duration sexually active						
0,1	1	.	.	1	.	.
2,3	1.13	0.56,2.28	0.726	1.57	0.80,3.05	0.187
4, 5 yrs	1.32	0.67,2.61	0.426	2.09	1.08,4.06	0.030
6,7	1.55	0.82,2.94	0.178	2.11	1.03,4.34	0.042
8,11	1.53	0.74,3.17	0.255	1.74	0.77,3.91	0.182

More parsimonious multivariable logistic regression analyses, outcome: unplanned pregnancy (16-24s)

Unplanned pregnancy n:1515/852.95	AOR	95% CI	p-value
Competence			
competent	1		
non-competent	2.01	0.97,4.19	0.062
Age at first sex			
first sex ≥16	1		
first sex ≤15	2.99	1.43,6.26	0.004
IMD quintile			
1: least deprived	1	.	.
2	0.99	0.28,3.54	0.986
3	1.38	0.41,4.63	0.600
4	1.65	0.56,4.90	0.366
5: most deprived	1.50	0.49,4.57	0.473
Parental social class			
no response	1.44	0.53,3.88	0.474
manual iv/v	0.54	0.21,1.42	0.214
non-manual i/ii/iii	1	.	.
Family Structure at 14			
Lived with both parents until 14	1		
One or neither parent	1.29	0.64,2.61	0.481
Main source of sex education			
Parents	1.43	0.56,3.65	0.457
School	1	.	.
Friends	0.81	0.35,1.85	0.614
Other	0.86	0.34,2.18	0.751
Duration sexually active			
0,1	1	.	.
2,3	1.36	0.39,4.72	0.632
4, 5 yrs	1.12	0.31,3.98	0.866
6,7	1.43	0.42,4.94	0.569
8,11	0.93	0.25,3.43	0.909

More parsimonious multivariable logistic regression analyses, outcome: non-volitional sex (16-24s)

Non-volitional sex n: 1507/846.88	AOR	95% CI	p-value
Competence			
competent	1		
non-competent	2.94	1.68,5.14	<0.001
Age at first sex			
first sex ≥16	1		
first sex ≤15	3.30	1.96,5.53	<0.001
Parental social class			
no response	1.37	0.67,2.80	0.385
manual iv/v	0.58	0.30,1.10	0.096
non-manual i/ii/iii	1	.	.
Educational level			
Left school at 16 no qualifications	0.64	0.28,1.46	0.289
Left school at 16 with qualifications	0.29	0.13,0.64	0.002
Left school 17+ with qualifications	1	.	.
Currently 16	0.74	0.17,3.13	0.679
Ethnic Group			
White	1	.	.
Mixed	1.63	0.64,4.13	0.303
Asian, Chinese, Other	1.20	0.25,5.69	0.818
Black	1.03	0.33,3.18	0.966
Family Structure at 14			
Lived with both parents until 14	1		
One or neither parent	1.22	0.77,1.94	0.390
Main source of sex education			
Parents	0.89	0.40,2.02	0.788
School	1	.	.
Friends	1.01	0.54,1.91	0.966
Other	1.39	0.78,2.49	0.267
Ease discussing sex with parents at age 14			
Easy with one/both	1	.	.
Difficult	2.39	1.05,5.43	0.038
Didn't discuss with either	1.43	0.80,2.56	0.231
Varied depending on topic	1.12	0.38,3.33	0.834
Duration sexually active			
0,1	1	.	.
2,3	1.95	0.49,7.76	0.341
4, 5 yrs	5.42	1.37,21.46	0.016
6,7	4.01	1.00,16.03	0.049
8,11	3.20	0.77,13.25	0.108

Appendix 9: Multivariable logistic regression analysis – association between each component of sexual competence and indicators of sexual health in fully adjusted models

MEN	Self-reported STI			HPV			Low sexual functioning		
	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Autonomous reason									
Yes	1			1			1		
No	0.91	0.47,1.76	0.775	1.58	0.79,3.17	0.197	1.09	0.65,1.84	0.745
Equally willing									
Yes	1			1			1		
No	1.73	0.83,3.61	0.145	2.16	0.97,4.79	0.059	1.51	0.87,2.63	0.143
Right time									
Yes	1			1			1		
No	0.74	0.44,1.25	0.257	1.36	0.77,2.41	0.291	1.4	0.92,2.12	0.113
Contraception									
Yes	1			1			1		
No	1.33	0.72,2.47	0.366	1.32	0.61,2.87	0.476	1.5	0.88,2.56	0.134

All AORs adjusted for: sex before 16, IMD quintile of residence at interview, educational level of respondent, parental social class, family structure at age 14, ethnicity, ease discussing sexual matters with their parent(s) at age 14, their main source of sex education, and duration sexually active

WOMEN	Self-reported STI			HPV			Low sexual functioning			Unplanned pregnancy			Non-volitional sex		
	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value	AOR	95% CI	p-value
Autonomous reason															
Yes	1			1			1			1			1		
No	1.37	0.96,1.96	0.082	1.93	1.28,2.91	0.002	1.49	1.01,2.20	0.046	0.86	0.35,2.11	0.739	1.47	0.85,2.53	0.168
Equally willing															
Yes	1			1			1			1			1		
No	1.76	1.19,2.61	0.005	1.3	0.86,1.97	0.210	2.31	1.50,3.53	<0.001	2.07	1.00,4.27	0.049	4.17	2.54,6.85	<0.001
Right time															
Yes	1			1			1			1			1		
No	1.13	0.81,1.58	0.465	1.49	1.05,2.10	0.024	1.45	0.99,2.13	0.056	2.73	1.27,5.86	0.010	3.49	1.99,6.12	<0.001
Contraception															
Yes	1			1			1			1			1		
No	1.4	0.88,2.24	0.160	0.95	0.56,1.59	0.834	1.73	1.00,2.98	0.048	0.87	0.32,2.40	0.790	1.24	0.67,2.29	0.501

All AORs adjusted for: sex before 16, IMD quintile of residence at interview, educational level of respondent, parental social class, family structure at age 14, ethnicity, ease discussing sexual matters with their parent(s) at age 14, their main source of sex education, and duration sexually active.

Appendix 10: Multivariable logistic regression – outcomes associated with sexual competence at first sex, also adjusted for sex before 13 and experience of non-volitional sex before first sex

Outcome: Self-reported STI	Women			Men		
	AOR	95% CI	p-value	AOR	95% CI	p-value
Sexual competence						
Competent	1			1		
Non-competent	1.42	1.02,1.97	0.037	1.2	0.74,1.94	0.468
Age at first sex						
First sex ≥16	1			1		
First sex ≤15	1.05	0.74,1.49	0.782	1.4	0.85,2.31	0.189
IMD quintile						
1: least deprived	1	.	.	1	.	.
2	0.92	0.53,1.60	0.769	1.41	0.67,2.96	0.359
3	1.24	0.75,2.06	0.407	1.26	0.54,2.92	0.59
4	0.97	0.57,1.66	0.919	1.08	0.48,2.42	0.849
5: most deprived	1	0.60,1.69	0.985	1.25	0.55,2.82	0.593
Educational level						
Left school at 16 no qualifications	1.49	0.83,2.64	0.178	1.04	0.33,3.26	0.947
Left school at 16 with qualifications	1.01	0.67,1.53	0.952	1.73	1.02,2.92	0.040
Left school 17+ with qualifications	1	.	.	1	.	.
Currently 16	0.61	0.17,2.22	0.455	1.33	0.20,9.00	0.771
Parental social class						
No response	1.01	0.59,1.75	0.961	0.93	0.42,2.08	0.865
Manual iv/v	1.17	0.78,1.74	0.455	0.78	0.41,1.49	0.458
Non-manual i/ii/iii	1	.	.	1	.	.
Family Structure at 14						
Lived with both parents until 14	1			1		
Live with one or neither parents until 14	1.08	0.77,1.49	0.664	0.73	0.44,1.22	0.232
Ethnic group						
White	1	.	.	1	.	.
Mixed	1.42	0.61,3.33	0.414	1.17	0.33,4.11	0.807
Asian, Chinese, Other	0.46	0.14,1.53	0.207	1.26	0.40,3.99	0.699
Black	4.41	1.89,10.27	0.001	1.79	0.41,7.88	0.439
Ease discussing sex with parents at age 14						
Easy with one/both	1	.	.	1	.	.
Difficult	1.51	0.86,2.66	0.150	1.16	0.38,3.53	0.790
Didn't discuss with either	0.84	0.59,1.21	0.359	1.13	0.59,2.14	0.714
Varied depending on topic	1.25	0.60,2.60	0.559	3.51	0.88,13.93	0.074
Main source of sex education						
Parents	0.76	0.45,1.28	0.304	1.12	0.43,2.92	0.819
School	1	.	.	1	.	.
Friends	1.34	0.91,1.99	0.142	1.66	0.94,2.96	0.082
Other	1.5	1.00,2.27	0.052	0.83	0.44,1.59	0.579
Duration sexually active						
0,1	1	.	.	1	.	.
2,3	5	1.99,12.56	0.001	3.47	0.70,17.14	0.126
4, 5 yrs	8.56	3.44,21.28	<0.001	6.27	1.24,31.77	0.027
6,7	16.88	7.01,40.69	<0.001	6.93	1.33,36.06	0.021
8,11	17.58	6.79,45.51	<0.001	16.97	3.21,89.72	0.001
Sex before 13						
No	1			1		
Yes	2.24	0.71,7.05	0.169	0.49	0.09,2.60	0.405
Non-volitional sex before first sex						
No	1			1		
Yes	1.2	0.44,3.24	0.722	.	.	.

WOMEN - Outcome: HPV	AOR	95% CI	p-value
Sexual competence			
Competent	1		
Non-competent	1.55	1.10,2.17	0.011
Age at first sex			
First sex ≥16	1		
First sex ≤15	1.15	0.82,1.62	0.410
IMD quintile			
1: least deprived	1	.	.
2	0.65	0.39,1.09	0.103
3	0.79	0.47,1.32	0.365
4	0.62	0.36,1.06	0.081
5: most deprived	0.68	0.40,1.15	0.153
Educational level			
Left school at 16 no qualifications	0.67	0.33,1.37	0.274
Left school at 16 with qualifications	0.93	0.57,1.51	0.766
Left school 17+ with qualifications	1	.	.
Currently 16	0.69	0.31,1.53	0.364
Parental social class			
No response	0.94	0.55,1.61	0.817
Manual iv/v	1.14	0.75,1.72	0.549
Non-manual i/ii/iii	1	.	.
Family Structure at 14			
Lived with both parents until 14	1		
Live with one or neither parents until 14	1.00	0.71,1.41	0.980
Ethnic group			
White	1	.	.
Mixed	1.51	0.62,3.68	0.36
Asian, Chinese, Other	0.33	0.13,0.86	0.023
Black	0.68	0.30,1.56	0.364
Ease discussing sex with parents at age 14			
Easy with one/both	1	.	.
Difficult	1.01	0.56,1.82	0.961
Didn't discuss with either	0.98	0.67,1.43	0.923
Varied depending on topic	1.33	0.52,3.41	0.557
Main source of sex education			
Parents	1.12	0.68,1.87	0.654
School	1	.	.
Friends	0.83	0.55,1.25	0.366
Other	1.16	0.76,1.78	0.491
Duration sexually active			
0,1	1	.	.
2,3	1.43	0.82,2.51	0.212
4, 5 yrs	1.44	0.78,2.63	0.24
6,7	2.05	1.14,3.68	0.016
8,11	1.72	0.88,3.38	0.114
Sex before 13			
No	1		
Yes	4.78	0.43,53.63	0.205
Non-volitional sex before first sex			
No	1		
Yes	0.51	0.12,2.22	0.370

MEN - Outcome: HPV	AOR	95% CI	p-value
Sexual competence			
Competent	1		
Non-competent	1.79	1.07,3.01	0.028
Age at first sex			
First sex ≥16	1		
First sex ≤15	1.26	0.77,2.07	0.360
IMD quintile			
1: least deprived	1	.	.
2	1.02	0.46,2.26	0.951
3	1.06	0.48,2.33	0.894
4	1.68	0.77,3.62	0.189
5: most deprived	1.16	0.50,2.66	0.727
Educational level			
Left school at 16 no qualifications	0.52	0.15,1.81	0.302
Left school at 16 with qualifications	1.36	0.78,2.38	0.276
Left school 17+ with qualifications	1	.	.
Currently 16	0.72	0.17,3.06	0.658
Parental social class			
No response	0.74	0.24,2.30	0.597
Manual iv/v	1.02	0.55,1.91	0.942
Non-manual i/ii/iii	1	.	.
Family Structure at 14			
Lived with both parents until 14	1		
Live with one or neither parents until 14	1.21	0.68,2.13	0.518
Ethnic group			
White	1	.	.
Mixed	0.11	0.01,0.90	0.040
Asian, Chinese, Other	0.26	0.04,1.70	0.160
Black	0.26	0.03,2.37	0.231
Main source of sex education			
Parents	1.36	0.51,3.64	0.544
School	1	.	.
Friends	1.24	0.65,2.34	0.515
Other	1.04	0.56,1.96	0.892
Discussed sex with parents at 14			
Discussed	1		
Did not discuss	0.73	0.42,1.26	0.257
Duration sexually active			
0,1	1	.	.
2,3	2.29	0.80,6.60	0.123
4, 5 yrs	2.21	0.74,6.66	0.157
6,7	5.13	1.79,14.71	0.002
8,11	3.96	1.21,13.03	0.023
Sex before 13			
No	1		
Yes	0.12	0.01,0.98	0.048
Non-volitional sex before first sex			
No	1		
Yes	.	.	.

Outcome: Low sexual function	Women			Men		
	AOR	95% CI	p-value	AOR	95% CI	p-value
Sexual competence						
Competent	1			1		
Non-competent	2.08	1.37,3.14	0.001	1.44	0.98,2.13	0.065
Age at first sex						
First sex ≥16	1			1		
First sex ≤15	1.09	0.71,1.66	0.699	0.85	0.54,1.32	0.471
IMD quintile						
1: least deprived	1	.	.	1	.	.
2	0.88	0.48,1.63	0.686	0.66	0.35,1.24	0.195
3	1.27	0.69,2.32	0.443	0.7	0.38,1.31	0.268
4	0.89	0.50,1.59	0.702	0.67	0.38,1.21	0.185
5: most deprived	0.81	0.43,1.49	0.491	0.69	0.38,1.23	0.204
Educational level						
Left school at 16 no qualifications	1.04	0.48,2.28	0.914	0.77	0.31,1.87	0.557
Left school at 16 with qualifications	0.86	0.50,1.48	0.574	0.88	0.53,1.45	0.604
Left school 17+ with qualifications	1	.	.	1	.	.
Currently 16	0.41	0.12,1.39	0.154	0.63	0.18,2.15	0.457
Parental social class						
No response	1.19	0.67,2.11	0.548	0.89	0.45,1.79	0.751
Manual iv/v	0.8	0.49,1.30	0.363	1.04	0.65,1.66	0.872
Non-manual i/ii/iii	1	.	.	1	.	.
Family Structure at 14						
Lived with both parents until 14	1			1		
Live with one or neither parents until 14	0.94	0.64,1.38	0.755	0.82	0.53,1.25	0.351
Ethnic group						
White	1	.	.	1	.	.
Mixed	2.26	1.00,5.14	0.051	1.25	0.38,4.17	0.715
Asian, Chinese, Other	1.92	0.83,4.45	0.129	1.08	0.44,2.63	0.867
Black	1.02	0.30,3.54	0.973	0.92	0.28,3.01	0.884
Ease discussing sex with parents at age 14						
Easy with one/both	1	.	.	1	.	.
Difficult	1.17	0.58,2.35	0.659	1.7	0.73,3.92	0.215
Didn't discuss with either	1.15	0.74,1.79	0.523	1.79	1.09,2.93	0.022
Varied depending on topic	0.46	0.14,1.45	0.184	0.56	0.11,2.74	0.474
Main source of sex education						
Parents	1.1	0.62,1.94	0.746	1.73	0.80,3.78	0.166
School	1	.	.	1	.	.
Friends	1.14	0.75,1.74	0.543	1.36	0.84,2.20	0.211
Other	0.93	0.54,1.59	0.781	1.03	0.63,1.68	0.907
Duration sexually active						
0,1	1	.	.	1	.	.
2,3	0.96	0.45,2.01	0.905	1.4	0.67,2.95	0.372
4, 5 yrs	0.97	0.46,2.05	0.932	1.83	0.86,3.91	0.12
6,7	1.19	0.59,2.40	0.633	1.82	0.79,4.21	0.161
8,11	1.15	0.49,2.69	0.747	1.46	0.56,3.76	0.436
Sex before 13						
No	1			1		
Yes	1.36	0.22,8.49	0.743	2.03	0.55,7.57	0.289
Non-volitional sex before first sex						
No	1			1		
Yes	0.89	0.27,2.98	0.854	7.04	0.52,95.18	0.142

Outcome: Non-volitional sex	AOR	95% CI	p-value
Sexual competence			
Competent	1		
Non-competent	2.92	1.67,5.12	<0.001
Age at first sex			
First sex ≥16	1		
First sex ≤15	3.33	1.98,5.61	<0.001
IMD quintile			
1: least deprived	1	.	.
2	0.74	0.34,1.64	0.461
3	0.74	0.34,1.58	0.431
4	1.09	0.51,2.30	0.829
5: most deprived	1.11	0.51,2.41	0.801
Educational level			
Left school at 16 no qualifications	0.57	0.24,1.32	0.190
Left school at 16 with qualifications	0.27	0.12,0.62	0.002
Left school 17+ with qualifications	1	1.00,1.00	.
Currently 16	0.7	0.17,2.96	0.628
Parental social class			
No response	1.36	0.67,2.78	0.393
Manual iv/v	0.56	0.28,1.10	0.091
Non-manual i/ii/iii	1	.	.
Family Structure at 14			
Lived with both parents until 14			
Live with one or neither parents until 14	1.19	0.75,1.91	0.458
Ethnic group			
White	1	.	.
Mixed	1.61	0.63,4.10	0.319
Asian, Chinese, Other	1.17	0.25,5.45	0.838
Black	0.93	0.29,2.99	0.897
Ease discussing sex with parents at age 14			
Easy with one/both	1	.	.
Difficult	2.39	1.06,5.41	0.036
Didn't discuss with either	1.4	0.78,2.51	0.257
Varied depending on topic	1.13	0.38,3.37	0.831
Main source of sex education			
Parents	0.9	0.40,2.05	0.809
School	1	.	.
Friends	1.03	0.54,1.96	0.936
Other	1.41	0.79,2.51	0.251
Duration sexually active			
0,1	1	.	.
2,3	1.86	0.47,7.27	0.375
4, 5 yrs	5.22	1.35,20.19	0.017
6,7	3.84	0.97,15.21	0.055
8,11	2.97	0.72,12.22	0.131
Sex before 13			
No	1		
Yes	2.66	0.40,17.71	0.310

Outcome: unplanned pregnancy	AOR	95% CI	p-value
Sexual competence			
Competent	1		
Non-competent	2.14	0.96,4.78	0.063
Age at first sex			
First sex ≥16	1		
First sex ≤15	2.34	1.08,5.09	0.032
IMD quintile			
1: least deprived	1	.	.
2	1.34	0.34,5.24	0.678
3	1.13	0.27,4.71	0.864
4	1.93	0.58,6.40	0.284
5: most deprived	1.96	0.56,6.93	0.294
Educational level			
Left school at 16 no qualifications	0.95	0.19,4.72	0.952
Left school at 16 with qualifications	0.79	0.32,1.93	0.602
Left school 17+ with qualifications	1	.	.
Currently 16	1.06	0.22,5.05	0.942
Parental social class			
No response	1.82	0.62,5.37	0.279
Manual iv/v	0.66	0.25,1.71	0.388
Non-manual i/ii/iii	1	.	.
Family Structure at 14			
Lived with both parents until 14	1		
Live with one or neither parents until 14	1.05	0.50,2.22	0.896
Ethnic group			
White	1		
Non-white	0.97	0.32,2.98	0.959
Discussed sex with parents at 14			
Discussed	1		
Did not discuss	1.34	0.59,3.02	0.483
Main source of sex education			
Parents	2.09	0.76,5.76	0.154
School	1	.	.
Friends	0.91	0.38,2.20	0.839
Other	0.76	0.25,2.26	0.617
Duration sexually active			
0,1	1	.	.
2,3	1.15	0.27,4.99	0.848
4, 5 yrs	0.94	0.20,4.35	0.935
6,7	1.43	0.33,6.18	0.633
8,11	0.96	0.18,4.99	0.958
Sex before 13			
No	1		
Yes	2.39	0.17,33.22	0.517
Non-volitional sex before first sex			
No	1		
Yes	2.36	0.17,32.62	0.520

Appendix 11: Coding scheme used for initial coding of qualitative interviews

Coding Frame

Willingness

- Verbal communication
- 'Just knew'
- Physical cues/body language
- Nature of the relationship (length/quality)
- The build up
- Presence/lack of pressure
- What happened after
- Importance
- Understanding of question

Timing

- The situation
- Knowing the person
- Nature of the relationship (length/quality)
- 'For myself'
- Feeling 'ready'
- Age
- What happened after
- 'At least it wasn't....' (a worse scenario)
- Can't know it's the right time until after
- Importance
- Understanding of question

What applied at the time....

- Answer: Natural follow-on in these relationship – 1) length of relationship, 2) quality of relationship, 3) engaging in other non-coital sexual practices.
- Answer: Most people in my age group seemed to be doing – 1) feeling 'left out' 2) overt pressure from peers.
- Pairing together of reasons
- 'Positive or negative' reasons – 1) definitely positive, 2) definitely negative, 3) depends on context
- Choosing a 'main' factor

Importance of age

- Depends on the person
- Depends on the relationship
- No ideal age
- A 'too young' age

- Discomfort thinking about others (younger siblings/children) having sex
- Negotiating age of consent in own experience

Role of enjoyment

- Just 'getting it done'
- Lower priority
- 'Can't expect it to be good'
- 'Know is gets better'
- Pain
- Importance at *first* sex versus *general* sex life
- Ranking in the card exercise

Appendix 12: The 'R U Ready' checklist

R U Ready?

Complete our quiz to find out if you might be ready.
Be honest with yourself!

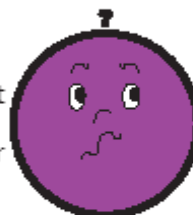
1. Do you feel you could say 'No' if you wanted to?
Yes ☐ Maybe ☐ No ☐
2. Can you have a laugh together without anything sexual involved?
Yes ☐ Maybe ☐ No ☐



3. Have you both made a special connection and it feels right to have sex?
Yes ☐ Maybe ☐ No ☐

4. Is your partner pressuring you to have sex?
Yes ☐ Maybe ☐ No ☐

5. Do you want to have sex for yourself and not to keep or please the other person?



Yes ☐ Maybe ☐ No ☐

6. Do you want to have sex because your friends say they're all doing it?
Yes ☐ Maybe ☐ No ☐



7. Are you embarrassed to talk together about using condoms?
Yes ☐ Maybe ☐ No ☐

8. Have you both agreed what contraception you will use?
Yes ☐ Maybe ☐ No ☐

9. Do you understand the risks involved in having sex? (i.e. pregnancy and STIs)
Yes ☐ Maybe ☐ No ☐

10. Do you think you might regret it later?
Yes ☐ Maybe ☐ No ☐



11. Have you already found out about each others' bodies and what you both like and don't like?
Yes ☐ Maybe ☐ No ☐

Now turn over to see if you might be ready.

